THE

AMERICAN GAS-LIGHT JOURNAL.

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VOL. III.—No. 48. NEW-YORK, MONDAY, DECEMBER 16, 1861. $3 PER ANNUM.

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We are now publishing regularly the names of the thirty thousand post-towns in the United States, so that builders of gas-works and water-works, and the various manufacturers, may see where are new openings for business. And as each post-master will receive several copies of the AMERICAN GAS-LIGHT JOURNAL, for distribution, the number thus circulated will probably exceed *Three Million Copies. What a chance for advertisers!*

POST-OFFICE TOWNS IN THE UNITED STATES,

ARRANGED BY STATES AND COUNTIES,

Showing where Gas-Works and Water-Works are Wanted.

NEW YORK.

60 Counties, 2,530 Towns, 78 Gas-Works, 16 Water-Works.

Albany County.

Albany, (c. h.)
Berne,
Bethlehem Centre,
Boght,
Callanan's Corners,
Cedar Hill,
Clarksville,
Coeymans,
Coeymans Hollow,
Cohoes,
Cooksburgh,
Dormansville,
Dunnsville,
East Berne,
Green Island,
Guilderland,
Guilderland Centre,
Indian Fields,
Ireland Corners,
Keefer's Corners,
Knowersville,
Knox,
Lisha's Kill,
Medusa,
New Salem,
New Scotland,
Newtonville,
Norman's Kill,
Potter's Hollow,
Preston Hollow,
Reidsville,
Rensselaerville,
South Berne,
South Westerlo,
Union Church,
Watervliet Centre,
Westerlo,
West Township,
West Troy.

Allegany County.

Alfred,
Alfred Centre,
Allen,
Allen Centre,
Alma,
Almond,
Andover,
Angelica, (c. h.)
Belfast,
Belmont,
Belvidere,
Birdsall,
Birdsall Centre,
Black Creek,
Bolivar,
Burns,
Canaseraga,
Caneadea,
Centre Almond,
Centreville,
Ceres,
Chautauque Valley,
Cuba,
East Rushford,
Elm Valley,
Fillmore,
Friendship,
Granger,
Grove,
Hallsport,
Houghton Creek,
Hume,
Independence,
Knight's Creek,
Little Genesee,
Mills' Mills,
Nile,
North Almond,
Oramel,
Phillips' Creek,
Richburg,
Rockville,
Rushford,
Scio,
Seymour,
Shongo,
Short Track,
South Bolivar,
Spring Mills,
Swainsville,
Transit Bridge,
Ward,
Wellsville,
West Almond,
West Clarksville,
Whitesville,
Whitney's Crossing,
Wirt,
Wiscoy.

Broome County.

Barker,
Binghamton, (c. h.)
Castle Creek,
Centre Lisle,
Centre Village,
Chenango,
Chenango Forks,
Colesville,
Conklin Centre,
Crandallville,
Doraville,
East Maine,
Glen Aubrey,
Glen Castle,
Gulf Summit,
Harpersville,
Hawleyton,
Hooper,
Killawog,
Kirkwood,
Lisle,
Maine,
Millburn,
Nanticoke Springs,
New Ohio,
Nineveh,
North Sanford,
Osborne Hollow,
Onaquaga,
Port Crane,
Randolph Centre,
Sanford,
Tracy Creek,
Triangle,
Union,
Union Centre,
Unitaria,
Upper Lisle,
Vallonia Springs,
Vestal,
Vestal Centre,
West Colesville,
West Windsor,
Whitney's Point,
Windsor.

Cattaraugus County.

Allegany,
Ashford,
Ash Park,
Buck Tooth,
Cadiz,
Cattaraugus,
Conewango,
Cottage,
Dayton,
East Ashford,
East Leon,
East Otto,
East Randolph,
Eldysville,
Elzin,
Ellicottsville, (c.h.)
Elton,
Fairview,
Farmersville,
Five Mile Run,
Franklinville,
Freedom,
Friend's Ferry,
Gowanda,
Great Valley,
Haskell Flatts,
Hinsdale,
Humphrey,
Ischua,
Kill Buck,
Leon,
Limestone,
Little Valley,
Machias,
Napoli,
New Albion,
Olean,
Onoville,
Otto,
Perrysburgh,
Plato,
Portville,
Randolph,
Rawson,
Sandusky,
Sugartown,
Tuna,
Versailles,
West Yorkshire,
Yorkshire,
Yorkshire Centre.

Cayuga County.

Auburn, (c. h.)
Aurelius,
Aurora,
Cato,
Cayuga,
Conquest,
Dresserville,
East Genoa,
East Venice,
Fair Haven,
Five Corners,
Fleming,
Fosterville,
Genoa,
Ira,
Kelloggsville,
King's Ferry,
Ledyard,
Levanna,
Locke,
Martville,
Meridian,
Montezuma,
Moravia,
Niles,
North Sterling,
Owasco,
Owasco Lake,
Pantico,
Poplar Ridge,
Port Byron,
Scipio,
Scipioville,
Sempronius,
Seneca River,
Sennet,
Sherwood's,
Sterling,
Summer Hill,
The Square,
Throopsville,
Union Springs,
Venice,
Venice Centre,
Victory,
Weedsport,
Westbury.

Chautauque County.

Arkwright Summit,
Barcelona,
Blockville,
Brigham,
Brockton,
Busti,
Cassadaga,
Centre Sherman,
Charlotte Centre,
Cherry Creek,
Clear Creek,
Clymer,
De Wittville,
Dunkirk,
Ellery,
Ellery Centre,
Ellington,
Falconer,
Fentonville,
Findley's Lake,
Fluvanna,
Forestville,
Fredonia,
French Creek,
Frewsburgh,
Friends,
Gerry,
Hamlet,
Harmony,
Hartfield,
Irving,
Jamestown,
Kiantone,
Laona,
Levant,
Magnolia,
Marvin,
Mayville, (c. h.)
Mina,
Nashville,
Oregon,
Panama,
Poland Centre,
Portland,
Ripley,
Sheridan,
Sherman,
Silver Creek,
Smith's Mills,
South Stockton,
Stedman,
Stockton,
Vermont,
Villanovia,
Volusia,
Westfield.

Chemung County.

Baldwin,
Beaver Dams,
Big Flats,
Breesport,
Catlin Centre,
Chemung,
Chemung Centre,
Elmira,
Erin,
Horseheads,
Mill Port,
North Chemung,
Pine Valley,
Post Creek,
Seely Creek,
South Erin,
Southport,
State Road,
Sullivanville,
Van Ettenville,
Veteran,
Webb's Mills,
Wellsburgh.

Chenango County.

Afton,
Ayeshire,
Bainbridge,
Bennettsville,
Cheshireville,
Church Hollow,
Columbus,
Coventry,
Coventryville,
East German,
East Greene,
East Guilford,
East McDonough,
East Pharsalia,
Genegantslet,
German,
Green,
Guilford,
Guilford Centre,
King's Settlement,
Linklaen,
McDonough,
Mount Upton,
New Berlin,
New Berlin Centre,
North Linklaen,
North Norwich,
North Pharsalia,
North Pitcher,
Norwich, (c. h.)
Otselic,
Oxford,
Pharsalia,
Pitcher,
Pitcher Springs,
Plymouth,
Preston,
Rockdale,
Sherburne,
Smithville Flats,
Smyrna,
South New Berlin,
South Otselic,
South Oxford,
South Plymouth,
West Bainbridge,
White's Store.

Clinton County.

Altona,
Beekmantown,
Black Brook,
Cadyville,
Champlain,
Chazy,
Churubusco,
Clintonville,
Dannemora,
East Beekmantown,
Ellenburgh,
Ellenburgh Centre,
Frontier,
Garlick Falls,
Ingraham,
Mooer's,
Mooer's Forks,
Morrisonville,
Perry's Mills,
Peru.
Plattsburgh, (c. h.)
Redford,
Rouse's Point,
Saranac,
Schuyler's Falls,
Sciota,
South Plattsburgh,
Union Falls,
Valcour,
West Chazy,
West Plattsburgh.

Columbia County.

Ancram,
Ancram Lead Mines.
Austerlitz,
Canaan,
Canaan Centre,
Canaan Four Corners,
Chatham,
Chatham Centre,
Chatham 4 Corners,
Churchtown,
Claverack,
Clermont,
Copake,
Copake Iron Works,
East Chatham,
Elizaville,
Flat Brook,
Gallatinville,
Germantown,
Ghent,
Glenco Mills,
Green River,
Harlemville,
Hillsdale,
Hudson, (c. h.)
Humphreysville,
Kinderhook,
Linlithgo,
Livingston,
Malden Bridge,
Martindale Depot,
Mellenville,
Moffett's Store,
New Lebanon,
New Lebanon Centre,
New Leban'n Springs,
Niverville,
North Chatham,
North Copake,
Philmont,
Smoky Hollow,
Spencertown,
Stockport,
Stuyvesant,
Stuyvesant's Falls,
Taghkanick,
Valatie,
West Taghkanick.

Cortlandt County.

Blodgett Mills,
Cincinnatus,
Cortl'dt Village, (c.h.)
Cuyler,
East Homer,
East Scott,
East Virgil,
Freetown Corners,
Glen Haven,
Harford,
Homer,
Hunt's Corners,
Keeney's Settlement,
Lapeer,
Little York,
McGrawville,
Marathon,
Messengerville,
Preble,
Scott,
Solon,
South Cortlandt,
Taylor,
Texas Valley,
Truxton,
Union Valley,
Virgil,
Willet.

Delaware County.

Andes,
Barbourville,
Bloomville,
Bovina,
Brushland,
Cabin Hill,
Cadosia Valley,
Cannonsville,
Clark's Factory,
Clovesville,
Colchester,
Croton,
Davenport,
Davenport Centre,
Delhi. (c. h)
Deposit,
Downsville,
East Branch,
East Roxbury,
Fergusonville,
Franklin,
Griffin's Corners,
Halcottsville,
Hale's Eddy,
Hamden,
Hancock,
Harpersfield,
Harvard,
Hobart,
Kortright,
Lordsville,
Lumberville,
Margarettville,
Masonville,
Meredith,
Moresville,
New Kingston,
New Road,
North Franklin,
North Hamden,
North Harpersfield,
North Kortright,
Ouleout,
Pepacton,
Roxbury,
Shavertown,
Sieney,
Sidney Centre,
Sidney Plains.
South Kortright,
Stamford,
Stockport Station,
Stratton's Fall,
Tremper's Kill,
Trout Creek,
Walton,
West Brook,
West Davenport,
West Kortright,
West Meredith.

Dutchess County.

Adriance,
Amenia,
Amenia Union,
Arthursburgh,
Attlebury,
Bangall,
Barrytown,
Beekman,
Bull's Head,
Carthage Landing,
Chesnut Ridge,
City.
Clinton Corners,
Clinton Hollow,
Clinton Point,
Clove,
Crouse's Store,
Crum Elbow,
Dover,
East Fishkill,
Federal Store,
Fishkill,
Fishkill Landing,
Fishkill Plains,
Freedom Plains,
Glenham,
Green Haven,
Hart's Village,
Hibernia,
Hughsonville,
Hull's Mill,
Hyde Park,
Jackson Corners,
Johnsville,
La Fayetteville,
La Grangeville,
Leedsville,
Lithgew,
Little Rest,
Locust Glen,
Mabbettsville,
Manchester Bridge,
Mansfield,
Matteawan,
Milan,
New Hackensack,
New Hamburgh,
North East,
North East Centre,
North East Station,
Oblong,
Oswego Valley,
Pawling,
Pine Plains,
Pleasant Plains,
Pleasant Ridge,
Pleasant Valley,
Poughkeepsie, (c.h.)
Poughquag,
Pulver's Corners,
Quaker Hill,
Red Hook,
Rhinebeck,
Rhinebeck Station,
Rock City,
Salt Point,
Schultzsville,
Sharon Station,
South Amenia,
South Dover,
Sprout Creek,
Staatsburgh,
Standfordville,
Stormville,
Tivoli,
Upper Red Hook,
Verbank,
Wapinger's Falls,
Washington,
Washington Hollow,
Wassaic,
Wing's Station.

Erie County.

Akron,
Alden,
Alden Centre,
Angola,
Big Tree Corners,
Black Rock,
Boston,
Bowmansville,
Brant,
Buffalo, (c. h.)
Buffalo Plains,
Cheetowaga,
Clarence,
Clarence Centre,
Clarksburgh,
Colden.
Collins,
Collins Centre,
Crittenden,
East Amherst,
East Aurora,
East Eden,
East Evans,
East Hamburgh,
Eden,
Eden Valley,
Eggertsville,
Elma,
Ellicott,
Evans,
Farnham,
Getzville,
Glenwood,
Grand Island,
Griffin's Mills,
Hamburgh,
Hamburgh on the Lake,
Harris Hill,
Holland,
Lancaster,
Langford,
Looneyville,
Marilla,
Marshfield,
Mill Grove,
Morton's Corners,
New Oregon,
North Boston,
North Buffalo,
North Clarence,
North Evans,
Patchin,
Pontiac,
Protection,
Reserve,
Sardinia,
Shirley,
South Wales,
Spring Brook,
Springville,
Tonawanda,
Town Line,
Wales,
Wales Centre,
Water Valley,
West Falls,
West Seneca,
West Seneca Centre,
Westwood,
White's Corners,
Williamsville,
Willink,
Winspear,
Woodward's Hollow.

Essex County.

Au Sable Forks,
Bloomingdale,
Crown Point,
Elizabethtown, (c.h.)
Essex,
Jay,
Keene,
Keeseville,
Lewis,
Minerva,
Moriah,
New Russia,
North Elba,
North Hudson,
Olmstedville,
Port Henry,
Port Kent,
Schroon Lake,
Schroon River,
Ticonderoga,
Upper Jay,
Wadham's Mills,
Westport,
Whallonsburgh,
Willsborough,
Wilmington.

Franklin County.

Alder Brook,
Andrusville,
Bangor,
Bombay,
Brush's Mills,
Burke,
Chateaugay,
Chateaugay Lake,
Cook's Corner,
Dickinson,
Dickenson Centre,
Duane,
East Constable,
East Dickinson,
Fort Covington,
Fort Covington Centre,
Franklin Falls,
Hogansburg,
Hunter's Home,
Malone, (c. h.,)
Moira,
North Bangor,
North Burke,
Saranac Lake,
South Bombay,
Titusville,
Trout River,
West Bangor.
West Constable.

Fulton County.

Bleeker,
Broadalbin,
Cranberry Creek,
Crum Creek,
Ephratah,
Garoga,
Gloversville,
Jackson Summit,
Johnstown, (c. h.)
Keck's Centre,
Kingsborough,
Lassellsville,
Lotville,
Mayfield,
Mill's Corners,
Newkirk's Mills,
Northampton,
North Broadalbin,
Northville,
Oppenheim,
Osborn's Bridge,
Perth,
Rockwood,
Sammonsville,
Stratford,
Union Mills,
Vail's Mills,
Westbush,
West Galway,
West Perth,
Whitesburgh.

Genesee County.

Alabama,
Alexandria,
Batavia, (c. h.)
Bergen,
Bethany,
Byron,
Corfu,
Darien,
Darien Centre,
East Bergen,
East Bethany,
East Elba,
East Pembroke,
Elba,
Le Roy,
Linden,
Morganville,
North Bergen,
North Pembroke,
Oakfield,
Pavilion,
Pavilion Centre,
Pembroke,
Roanoke,
South Alabama,
South Byron,
Stafford,
Stone Church,
West Bergen,
West Bethany Mills,
Wheatville.

Greene County.

Acra,
Ashland,
Athens.
Big Hollow.
Bushnellsville,
Cairo.
Catskill, (c. h.)
Cornwallville,
Coxackie,
Durham,
East Durham,
East Jewett,
East Windham,
Freehold,
Gayhead,
Greenville,
Heusonville,
Hunter.
Jewett Centre,
Kiskatom,
Leeds.
Lexington,
Medway,
New Baltimore,
Norton Hill,
Oak Hill,
Palenville,
Prattsville,
Red Falls,
South Cairo,
South Durham,
Stoney Clove,
Tannersville,
Union Society,
West Kill,
West Lexington,
Windham Centre.

Hamilton County.

Benson,
Benson Centre,
Gilman,
Hope Centre,
Hope Falls,
Lake Pleasant,
Morehouseville, (c.h.)
Sageville,
Wells.

Herkimer County.

Booth,
Brockett's Bridge,
Cedar Lake,
Cedarville,
Cold Brook,
Columbia,
Danube.
Denison,
East Creek,
East Schuyler,
Eatonville,
Fairfield,
Frankfort,
Frankfort Hill,
Gravesville,
Gray.
Herkimer, (c. h.)
Ilion,
Jordanville,
Litchfield,
Little Falls,
Manheim Centre,
Middleville,
Mohawk,
New Graefenberg,
Newport,
Newville,
North Winfield,
Norway,
Ohio,
Page's Corners,
Paine's Hollow,
Poland,
Russia,
Salisbury.
Salisbury Centre,
South Columbia,
Starkville,
Van Hornesville,
Warren,
West Schuyler,
West Winfield,
Winfield.

Jefferson County.

Adams,
Adams Centre,
Alexandria,
Antwerp,
Belleville,
Bentley's Corners,
Black River,
Brownville,
Burr's Mills,
Cape Vincent,
Carthage,
Champion.
Chaumont,
Clayton.
Clayton Centre,
Depausville,
Dexter,
East Houndsfield,
East Rodman,
Ellisburgh,
Evans' Mills,
Felt's Mills,
Great Bend,
Henderson,
La Fargeville,
Le Raysville,
Limerick,
Lorraine,
Mannsville,
Millen's Bay,
Natural Bridge,
North Adams.
North Wilna,
Omar,
Orleans Four Corners,
Oxbow,
Pamelia Four Corners.
Perch River,
Philadelphia,
Pierrepont Manor,
Pillar Point,
Plesis.
Point Peninsula,
Redwood,
Robert's Corner,
Rodman,
Rural Hill,
Rutland.

(*To be continued.*)

ROCHESTER, N. Y.—The water-works at this place have been fully organized under a very favorable charter, and have contracted with the city to furnish water for the Fire Department and public buildings on terms favorable to the company.

The directors have let the work of constructing the whole system of works, reservoirs, dams, mains, and distributing pipe to Messrs. Wyckoff, Hobbin & Co., who are completing the water-works of Elmira, N. Y. The cost of the Rochester water-works is to be $500,000. Work will not be commenced until the spring.

This important work is under the control of Mr. Daniel Marsh, an abstract of whose report on the proposed water supply of Rochester will be found on page 221 of vol. 2.

LIABILITY OF GAS-COMPANIES FOR NEGLIGENCE OF THEIR SERVANTS.

The question as to how far a gas company is liable for injuries arising from the negligence of its servants has recently been decided in England, in a case involving damages to a very large amount. This action excited great attention throughout Great Britain, and the scientific witnesses whose testimony was taken, enunciated several facts worthy of remembrance. The London *Journal of Gas-Lighting* devotes a large space to the report of this trial. Our limits will not allow of our publishing the report in detail, but we present a condensed account of the main points elicited with a portion of the scientific testimony given at the time.

The proceedings were held in the Court of Queen's Bench, before Lord Chief Justice Cockburn and a special jury.

Messrs. Sturgeon and Peacock were warehousemen and trimming manufacturers, carrying on business at No. 121 Wood street. They were the occupiers of the premises which, in February, 1860, were destroyed by the fire to which the attention of the jury would have to be particularly directed; the premises being numbered 121, and adjoining other premises in the same street occupied by Messrs. Morley. This was an action brought by the plaintiffs against the Great Central Gas Company, for the purpose of recovering against them the amount of damage which the plaintiffs had sustained by reason of that fire. The action was brought to recover damages which the plaintiffs had sustained by reason of the negligence, as they alleged, of the Central Gas Company, through their servants, in laying on gas to the premises of Messrs. Morley, on the morning of Monday, the 27th of February, 1860. About ten o'clock on that morning, the men were engaged in laying on the gas there, when suddenly a very violent explosion took place, the result of which was that Mr. Morley's premises were set fire to, and in an incredibly short space of time, the whole of his premises, together with the adjoining ones of Messrs Blenkiron on the one side, and Messrs. Sturgeon on the other, were utterly and entirely destroyed; the loss at the three houses being no less than from £50,000 to £60,000. The question was, whether that fire and consequent damage was brought about by the negligence of the defendants; for, although they were not present themselves in laying down the gas, if the parties actually engaged in the work were guilty of negligence, those who were their superiors and employed them were equally liable as if they had been personally upon the spot. Before the 27th of February, 1860, the premises of Messrs. Morley had been supplied with gas by the Chartered Gas Company, which had been established very many years before the establishment of the defendant's company, which was a rival company, incorporated in the year 1851, and in the year 1860 was competing with the Chartered Company very considerably within the city of London, in the neighborhood where Messrs. Morley's premises were situated. The mains of the Chartered Company were laid down pretty nearly in the centre of the carriage-way of the street, at a distance of some nine or ten feet from the outside of these premises, along the whole length of the street. By means of a service-pipe from that main, the premises of Messrs. Morley had been supplied; and they had had no reason to be dissatisfied with that supply. It appeared that a person of the name of Cheeseman, an inspector in the service of the Great Central Gas Company, knowing that Messrs. Morley had been supplied up to that time with gas from the Chartered Company, and being acquainted with the father of Mr. Morley, made application to that gentleman to induce his son to change his supply from the one company to the other. Mr. Morley undertook to speak to his relative on the subject, who ultimately assented to the change, the Great Central Company undertaking the whole management of the affair, and engaging that Mr. Morley should have no trouble in the matter. Accordingly, the defendants sent one of their servants down to see the size of the premises, and what number of burners would have to be supplied; and, on the morning of the 27th of February, two of their men were employed to lay on the necessary service-pipe. The Great Central Company's mains were laid through Wood street in a way which was somewhat novel in the city of London until within a recent period. There were two mains running through the entire length of the street—one main on the eastern side, of 10 inches diameter; and a second main, of 3 inches diameter, on the western side of the street, underneath the foot pavement, which was the side on which Messrs. Morley's premises were situated; and these mains were connected at intervals by feeders. It was from the 3 inch main that Messrs. Morley's premises were to be supplied by means of a service-pipe. The distance from the 3-inch main to the outside of those premises was 3 feet 1 inch; and, therefore, it was much nearer than the main of the Chartered Company. The premises consisted of four floors—a basement floor, a ground floor, a first floor, and a floor above; the whole height of the building being about 42 feet from the ground. Communicating between the basement and the ground floor, and so on through the various floors of the building, was an open staircase, forming a sort of shaft, running through from the base to the top. The basement was lighted partially by two windows, and partially by gas, for the convenience of the work people, during the greater part of the day—certainly through the greater part of the winter days. In that basement floor, at the time the fire occurred, there were four gas-burners, suspended at a distance of somewhere about 2 feet from the ceiling. One of these burners was close to the front, two were about the centre of the basement, and a fourth near the hydraulic press; the latter being only occasionally used. These burners were, for the convenience of the men at work, kept constantly alight—certainly during the winter time. In front of the premises, and over a portion of the foot-pavement, was an iron grating, and beneath that iron grating a small area, communicating with the interior of the basement floor below the surface of the footway, by means of folding windows. Over and above the pavement, there was also an iron grating, which opened inward; and, behind that iron grating was another window, also opening inward, and through these windows, the Messrs. Morley were in the habit of sending a vast quantity of goods down into the basement story. There was a sort of headway over these windows, which entirely separated the basement from the ground floor, between which there was no communication at all, except through the open staircase. On the right-hand side of the windows was another small grating, near to the entrance by the front door, which communicated with the water-closet in the basement; and over the top of the closet, communicating with the small grating, was another small window, which was kept open for the purpose of affording ventilation to that closet There was a further opening, close to the gas-meter. Upon the morning of the fire, the Great Central Company, having obtained the consent of Mr. Morley to change the supply of gas from the Chartered Company to themselves, sent two workmen, named Bicknell and Allen, for the purpose of arranging the service. Bicknell went down into the basement floor, and saw a person, who would be called as a witness, and asked whether the lights could be put out? The man said they were necessary for the people engaged in the premises to work by. Bicknell took no further notice of the matter, and made no application to Mr. Morley, or any one else except this person, but, leaving the gas-lights burning, proceeded, according to his own account, to make a hole in the wall of the house for the purpose of laying on the new service. First of all, they dug a small trench from the Great Central Company's mains up to the external wall of the house, and then proceeded to make a hole 14 or 15 inches square in the wall to allow the service-pipe to enter. They did not, in the least degree, intimate any further desire to have the lights put out, or take any precaution to prevent an escape of gas. They then knocked a hole, an inch and a half in diameter, in the side of the main; and, after they had been at work some five or six minutes, a sudden and very violent explosion took place, which was preceded for two or three minutes by a powerful smell of gas. The result was, the whole building caught fire; and, in the course of a short time, very nearly the whole of the property in the three houses was utterly destroyed. The complaint against the Great Central Company was, that they, by their servants, were negligent in the course they thought fit to pursue. It was complained against them that they were negligent in a variety of ways, and that there were many precautions which they might, had they thought fit to do so, have brought to bear upon the work they were doing, which, with ordinary intelligence and knowledge, might have been adopted by them, and which, had they been adopted, would have averted the accident. If there was a hole in the wall, some 14 or 15 inches square, with gas issuing from the main within 2 or 3 feet from the house, it was impossible for a man skilled in his business not to know that that gas must escape into the premises; and if that gas was escaping at the rate of 30 or 40 cubic feet per minute, that some violent explosion or immediate danger to the place must have ensued.

Mr. Hawkins, one of the counsel for the plaintiffs, in his opening speech said—He believed that he was very much understating the matter when he said 30 or 40 feet, and that it would be between 40 and 50 feet; but he preferred being within the mark, as the smaller quantity, under the circumstances, would be sufficient to account for the explosion. There was one course which might have been adopted, that he would now state to the jury. On the morning in question, the windows, both above and below the pavement, had been opened. He would call the persons forward who opened those windows, so that there should not be a shadow of doubt upon the point. But the men who were engaged in laying on the service-pipe, though they knew those windows were open, in close contiguity with the main itself, and that there were three burners alight in the basement at the time, did not even take the precaution to close the windows, or ask to have them closed. It did not seem that they denied knowing the windows to be open, but what they said was, that, having made a hole in the wall, they blocked up that hole. He (Mr. Hawkins) would be able to satisfy the jury that they did no such thing; and he would also prove to them, beyond a doubt, that, even if they had plugged it up with tow in the way they said, it would not prevent the escape of gas into the premises—not, perhaps, with such a rush as it would have done had there been no tow, but yet in sufficient quantities, in the course of a minute or two, as to cause an explosion, and bring about the results which actually followed. Of course, the length of the jet of gas, and the force with which it would be propelled into the house, would depend upon the pressure in the main; but the jury would find that the pressure was sufficient to send it to such an extent into the lower part of the basement, that, even at some distance from the external wall, very speedy ignition would take place. They would find this fact particularly referred to when he called before them the scientific evidence which he had to offer. The question was, what did cause the explosion? He did not think it would be contended, that if the hole which was made in the wall of the house for the purpose of admitting the service-pipe had remained unplugged, the company were not guilty of the grossest negligence He denied, on the part of the plaintiff, that the hole was stopped; and he should have to lay before the jury the evidence of a witness, to the effect that a few minutes before the fire took place he actually saw the lights shining through the hole in which the service-pipe was to run. So that, supposing it were proved by Bicknell that they had put a quantity of tow into the hole, to prevent the gas escaping into the house; yet, still, it was evidently so loosely packed in as to allow the light to show through into the basement; and therefore there was no doubt that a large quantity of gas could get through that part so left open. But, even supposing they did put the yarn into the hole, the jury would find that there was the evidence of a number of persons that this was an unsafe mode of dealing with it, on account of the property of gas to permeate through a porous body like that. Assuming, however, that the hole was effectually stopped, there were other precautions, to prevent the gas escaping into the premises, which ought to have been adopted. In the first place, the basement windows should have been closed; in the second place, the lights should have been put out, and then the gas could have been laid on without injury to the premises. But both of these precautions were neglected by the company's servants. Now, admitting for one moment that he was in a condition to establish, to the satisfaction of the jury, the fact that these openings communicating with the basement were there, let them inquire what the effect must be. Here was a large shaft formed by the various staircases leading to the different parts of the building from the basement to the top, and the effect was to create a thorough up-draught, so that, when a quantity of gas was emitted from the main within some two or three feet of the external wall of the house, it must have been obvious to any one acquainted with the properties of that dangerous fluid, if a moment's consideration were given to the subject, that a large proportion of that gas would find its way into the basement story, and, there being lighted burners there, cause an explosion. There were one or two modes by which that might have been avoided—and it was avoided by other companies—by the mode in which they actually tapped their mains. One mode referred to on the former occasion, and which appeared to be then misunderstood, was that of bladdering the main. This was effected by cutting a small hole in the main on either side of the spot where the proposed service was to be made, and then inserting a bladder in each, which bladder was afterwards inflated, making the main perfectly air-tight. When that was done, it stood to reason that, whatever might be the pressure of the gas in the main, none could find its way into the space so cut off; and thus the service could be laid on without any fear of escape. This was a course constantly adopted, preventing not only the escape and waste of gas to the company, but annoyance to passers by in the street, and danger to the premises about to be supplied. There was another mode, which was constantly adopted, and which, for the sake of avoiding danger to adjoining premises, ought to have been adopted here. That mode was, instead of making a hole in the side of the main directly opposite the building, by which a great jet of gas was projected along the trench towards it, to make the hole on the top of the main, and then put in an elbow for the purpose of communicating with the premises. If this had been done, the gas would not have been impelled with such violence towards the house; it would still have escaped and been unpleasant—perhaps dangerous—to passers by, but it would have been attended with much less danger to the premises about to be supplied. These were some of the modes which might have been adopted; but neither of these nor any other precaution was resorted to, although the men must have been aware that, had they done so, the service-pipe could have been laid on with the most perfect safety. They seemed to have opened the trench in the most reckless manner, without taking even the ordinary precautions which a child would have adopted under the circumstances, and the result was the accident which was now to be the subject of investigation. He did not think he should assist the jury by going more into details at the outset of the inquiry. He should have a number of witnesses to produce from all parts of the country, for he was sorry to have to state that the plaintiffs had had the greatest difficulty in getting witnesses from the London companies to support their

case. These companies seemed to have a system of their own, and it was very difficult to get any evidence from them; but the plaintiffs had been enabled to obtain evidence from persons connected with gas companies in different parts of the country, and, if it were necessary, they should be able to strengthen their case by scientific evidence. But the facts were so plain, that it seemed to him almost unnecessary to do so, for it must be obvious to any man, of the most ordinary common sense, that, to allow such an escape of gas within 3 feet of the outside wall, with windows open, and lights burning in the basement, must, of necessity, be attended with imminent danger to the house. He had been reminded of one point, but he did not know that he need trouble the jury upon it—viz., that the premises of the plaintiffs were insured. It might be said, on the part of the defendants, that this was a question between the insurance offices and the gas-company; but, whether it were so or not, did not signify at all. The insurance companies were bound to pay the money to Messrs. Sturgeon, but they had a right to call upon the gas company for the damage they had been required to make good, on account of the negligence of their servants. His lordship would tell them that it did not make the slightest difference in the matter whether the action were brought to cover the loss sustained by Messrs. Sturgeon or to indemnify the insurance offices, and that the gas company, in either case, were equally liable, if they brought about this catastrophe by any negligence, either of themselves or of those whom they sent to do their work. This was a short statement of the plaintiffs' case; he was afraid the jury would be obliged to listen to a great deal of evidence in support of it, but in the result he felt assured that his clients would have their verdict.

The opening address of Mr. Hawkins was fully corroborated by witnesses who described the situation of the premises, and the arrangement of the lights, windows, &c., and the occurrence of the explosion and conflagration substantially as represented. The evidence of the gas engineers, as to the proper manner of tapping mains, and the testimony of the eminent chemists, are worthy of attention, as they impart information of the most valuable character. Among the engineers examined was Edward Alfred Cowper, Esq., who testified as follows:

Edward Alfred Cowper, Esq., examined by Mr. HAWKINS—I am a consulting engineer, of Great George street, Westminster, and have been so for the last ten years. I have had a great deal of experience in mechanical engineering, and, amongst other things, in gas-works, though not so extensively in gas as many others.

Mr. HAWKINS—I am, first of all, going to direct your attention to the fact of a 1½-inch service being about to be connected with a 3-inch main. Can you tell us what modes there are by which all danger may be obviated?

Witness—Yes.

Lord Chief Justice COCKBURN—That does not relate to a 3-inch main, but to mains in general. Have you ever had to do with laying down mains?

Witness—Yes, my lord; I have had to lay down gas-works.

Mr. BOVILL—And service-pipes?

Witness—Not service-pipes—gas-mains.

Mr. HAWKINS—But you have become acquainted with the mode?

Witness—Yes Shall we take a 3-inch main, or mains in general? Because, in large mains, it is almost universally the case to bladder.

Lord Chief Justice COCKBURN—I do not suppose it will be disputed that, with a large main, it is proper. The question is, whether it is done with a 3-inch main.

Witness—In laying a 1½-inch service on a 3-inch main, the proper course would be to bladder the main at one point if the supply of gas was from one end, and at two points if the supply were from both ends; and then to offer the T-piece against the pipe—measure it against the 3-inch main, and cut out such a length as would admit of the insertion of the T-piece. When the T-piece is inserted, the bladders are withdrawn. Another mode is to bladder and drill a hole in the main without a T-piece; but, where so large a service as a 1½-inch is laid on to a 3-inch main, it is decidedly preferable to put in a T-piece, because so large a hole as it is necessary to drill weakens the main.

Lord Chief Justice COCKBURN—That is with a view to ulterior purposes.

Witness—Yes; with regard to danger, also; because there is some danger of splitting the main. That is the reason why it is better to put in a T-piece than to drill a hole. As I said before, the second best plan would be to bladder the main, and drill a hole. Another mode would be to bladder the main, and cut the hole with a chisel. A worse plan still would be, not to bladder at all, and the worst of all would be not to bladder, nor to drill, but to cut the hole with a chisel without any precaution. In fact, in most cases, the workman's time which would be occupied in bladdering is so little, that it would be paid for by the gas that actually escapes in cutting the hole without it. A thousand feet of gas may escape while that is being done, which is worth 3s. or 4s. [Witness explained the process of drilling.]

By Mr. KARSLAKE—Drilling is preferable to cutting, because it takes much less time to get a sufficiently round hole for the tap. The hole made by cutting is so rough, and so out of the round, that it requires a great deal of paring before you can get the tap to work, and it is utterly impossible to prevent a large quantity of gas escaping. I have known cases in which all these modes have been adopted. It would be better to cut the hole in the top than at the side of the main, because then the escape of gas would be upwards instead of towards the house. The gas issues from the hole with so much force that, if cut in the side of the main, it will pass horizontally, or nearly so, for several feet, the same as a jet of water issuing from a pipe under pressure. I have tried an experiment in order to prove this, and found that from 1¼-inch hole, the gas will go 4 feet before it rises 9 inches, and 5 or 6 feet more before it fairly turns up—that is with a pressure of 10-10ths, or 1 inch of water.

By the COURT—In its advance of 4 feet, it will rise 9 inches under this, which is the common pressure. With any extra pressure, it would pass much further.

By Mr. KARSLAKE—I have seen this experiment performed for the purpose of showing how far a jet of gas will be propelled. You will understand that I am speaking of gas passing horizontally without anything to guide it. If there were anything to guide it, it would pass much further. It is a fact that gas, unless mixed with air, will not burn at all; it requires a large quantity of air.

Lord Chief Justice COCKBURN—What is the proportion?

Witness—With the proportion of 3¾ of atmospheric air, it will not burn. It requires about 4½ to make it burn. With 19 atmospheres to 1 of gas, it will not burn from excess of air.

By Mr. KARSLAKE—It is only when gas comes in contact with air that it becomes inflammable; so that, if you put a candle into a place full of gas where there is no air, it would be extinguished. Gas has a natural tendency to mix with air; but, in some scientific works, it is stated that every gas is a vacuum for every other gas—that is to say, that gas coming out of a burner would mix itself with atmospheric air: but, in reality, gas issuing in a jet from any pipe or opening where there is any pressure, is like a jet of water. It is not so strong as water, and will not continue so long; but it will mix with air, entirely dependent upon whether there is any obstacle to prevent it, or whether it lies in a pretty close place, where the air can mix with it freely.

Mr. KARSLAKE—Having mixed with air, what is the smallest proportion in which an explosive mixture is formed? How many parts of air, and how many parts of gas?

Witness—One to 10 is the worst; 1 to 17 will cause a very slight explosion. With 1 to 8, or 1 to 12, there is not much harm—that is, with this particular gas. I am speaking of common coal-gas; it makes a difference in it whether it is 12-candle or 13.

Mr. KARSLAKE—When you say the worst, I understand you to mean that it is the most violent explosion when mixed in that proportion?

Witness—Yes; 10 to 1.

Mr. KARSLAKE—Now, supposing gas to be escaping near a building which is warm—warmer than the external air—and there are apertures in that building, is the effect to draw in the gas and air very rapidly?

Witness—Yes; certainly. Any open door or window in the lower part of the house would almost inevitably cause the air and gas to be drawn into the house, because it is very seldom that the house is not warmer than the outside air. Sometimes in summer it may not be, but it is rarely the case. If there were an opening in the basement, such as a staircase, it would act as a chimney, and the gas and air would pass freely upward. I should explain that, though gas is lighter than air, when it becomes mixed with air so as to form an explosive mixture, its ascending power is very much reduced; its specific gravity is increased, and it is readily drawn in at any door or window. It then follows any current; there is very little difference between it and common air.

Cross-examined by Mr. BOVILL—Before this accident occurred, I do not know that I ever saw a 3-inch main bladdered when a 1½-inch service was to be inserted. A connector is very commonly used when laying on a service. [Witness described the mode of using the connector.] Whether the service-pipe is put into the main itself, or the connector is used, it is equally necessary to make the hole of the same size, and to make the same arrangement as to the screw. The difference which it makes as to the escape of gas is, that the end of the connector is capped, while the service is being prepared. During the time of cutting or drilling the hole, there is no difference; but, if you have to measure your service, and bring it through the house, much time is lost. The use of the connector only affects the escape of gas from the hole after it is completed. I have heard it stated that, at the time of this explosion, the man was at work with his instrument at this hole. The use of the connector would have no bearing upon the question before the hole was finished. The use of an elbow is another contrivance; it is inserted in the pipe after the hole is finished: it has no effect until then.

Mr. BOVILL—Is it a common practice or not where you desire to insert a service-pipe into a 3-inch main, to take the trouble to cut out the piece and then put in a T-piece?

Witness—It is only too common not to cut out the piece.

Mr. BOVILL—That is not a straightforward answer. I ask you distinctly whether you mean to say it is a common practice where a service-pipe is inserted in a 3-inch main to take out a piece and insert a T-piece?

Witness—I will not undertake to say it is a common practice; it may be done as many times one way as another, for anything I know. I believe it is not the common practice, in putting a service-pipe into a 3-inch main, to tap a hole and put the service into it, but to drill it. I have seen many hundred service-pipes laid, of all sizes. I have been consulting engineer to a gas-work, and am so now, at Weston-Super-Mare, and at Price's Works, at Bromley. I do not commonly attend to the laying down of services. I will not undertake to say that I have seen a T-piece inserted in a 3-inch main where the only object was to put on a service. The object of drilling is to get as nearly a round hole as you can; it is then made perfectly round with a chisel. If they do it properly, they have no necessity for a rymer—they use a tap and chisel. In drilling, they do not begin at the centre; the drill is of the entire width of the opening proposed to be made, and cuts a cylindrical hole through at once. There is a little escape of gas while the operation is going on, which increases to a certain extent until the hole is completed; but the men put a piece of hemp round the drill, so that, after all, very little escapes till the hole is made. In adopting the other mode, the man ought to mark on the main, with chalk, the position and the size of the hole he wants; but the common practice is to do it by guess. Having chalked round the hole, he takes a chisel and hammer, and chips a groove round the circle. During that process, there is no escape of gas whatever. Having got the groove what he considers the proper depth, he strikes the piece in with his hammer, and then, for the first time, the gas escapes. This system is more adopted in London than that of drilling—in practice, it is the commonest plan in London. When I say generally, it is not universal—it is very commonly adopted. * *

Mr. BOVILL—Now, I come to the experiments you have made. You have told us that, when the gas escaped at a pressure of 10-10ths, you found that it passed out, gradually rising; and that, at 4 feet from the hole, it was 9 inches above.

Witness—Yes, thereabouts. We used a 3-inch pipe, and the gas issued at that pressure. I understood that in Wood street, the man was at work with his chisel, and using both hands at the hole at the time of and before the accident. That would have the effect of breaking the flow of gas, to a certain extent, and causing some of it to disperse. I made an experiment with a trench and a hole in a wall. I found the gas lit 8 feet 6 inches from the hole in the pipe.

Mr. BOVILL—You say that, at 4 feet from the main, the gas rose 9 inches, and you told me that you knew the man was stooping over this hole, and using both hands and a hammer and chisel—did you find out how far the gas had risen at 4 feet.

Witness—No, I did not measure it exactly; but I can tell you this, that the hole in the wall was 11 inches from the top of the pipe.

Mr. BOVILL—In what case?

Witness—In the case of the man with the chisel. In that case, the gas rose 11 inches, because it went through the hole in the wall, which was above.

Mr. BOVILL—You assume that it did go through the hole in the wall, and that is the reason for your opinion?

Witness—Yes. The wall was 3 feet 1 inch from the main, and the gas lit, after passing through the hole in the wall, at an elevation of 11 inches. The circumstances were made to resemble these as close as possible, and the light was held as might be here [pointing]—that is 8 feet from the pipe.

Another engineer who testified on this occasion was Mr. J. E. Clift, of Birmingham. He thus mentioned the effect of gas issuing from mains under a pressure of 1 inch, while performing an experiment under circumstances similar to those which caused the accident for which damages were claimed.

Gas issuing from a main at 10-10ths pressure, would go with considerable force in the direction of the wall. I have made some experiments on the subject. I took a bundle of tow—such as main-layers use, and such as service-pipe-layers always carry with them in their carts—and had it made into a ball, to bar the hole in the wall, and it was forced into the hole described, in the garden-wall at Uxbridge. The workman at the gas-work took it in his hands, and pushed it into the hole, as a service-pipe-layer would do if he were going to stop it. We then turned on the gas with 10-10ths pressure, and allowed it to blow against the hole. A light was held on the opposite side of the wall, and the gas was ignited at a distance of 3 feet from the hole, or about 6 feet 9 inches from the main—the thickness of the wall being about 9 inches. In this case the flame did rush back to the hole

We give, in full, the testimony of the chemists who

were examined. Their remarks on the explosiveness of the various mixtures of gas and air will be found well worthy of perusal.

Dugald Campbell, Esq., F. C. S., examined by Mr. POLLOCK—I am an analytical chemist, and have had great experience, both practical and theoretical. I am well acquainted with the properties of coal gas, and of its diffusion and mixture with other gases. Coal-gas very readily mixes with atmospheric air or any other gas. If coal-gas is admitted from a jet into the atmosphere, there is a diffusion through it, and it becomes an explosive compound, when the air predominates over the gas to a certain extent. When the gas reaches to about 7 per cent. of the air—that is to say, when air contains about 7 per cent. of gas—it will then become explosive. That would not be the most explosive compound. From 10 to 12 per cent. is highly explosive. When there is about 20 per cent. of gas, the mixture is more combustible than explosive. I have seen the premises in Wood street since they were rebuilt. I have also seen the model which represents them as they were. I have measured the quantity of gas that would escape from a batswing burner at a pressure of 10-10ths at the meter; it would be about 5 cubic feet per hour. If a single burner had been left unturned in the basement of these premises, there would not be sufficient escape to form an explosive compound for some hours, even supposing the basement to be hermetically sealed. Suppose the basement, instead of being hermetically sealed, to have been open as shown in the model, I do not think that in any given amount of time during which the gas might be allowed to escape, there would be found an explosive compound, the diffusion would be so great, and the draught also. It would take about 4,000 cubic feet of air to fill that place. Before any explosive compound was formed, the smell of gas would be very perceptible. A half per cent. of coal-gas in air is distinctly perceptible, and is obnoxious.

Lord Chief Justice COCKBURN—Making allowance for the draught of air in such a place, you do not think it would ever explode?

Witness—I am sure it would not.

By Mr. POLLOCK—Supposing, instead of one, there were two or three burners left open in this basement, it would take a very long time—some hours—before an explosive compound was formed; and the same observation which I made with reference to the smell, would apply with increased force. I have proved by experiment what would be the current of air in such a building as that. I was with the last witness on the 6th of February, at Wood street, and witnessed the experiments which he detailed; I also took samples of the atmosphere after the gas had been allowed to flow in the way described by him. We first tried, by means of lighted papers held up towards the window, whether there was an indraught. The first experiment was made with all the windows open; the second with only the lower half of the French window open. In the latter case, we found, by the lighted paper, that there was a very noticeable indraught. We then made an experiment by putting out all the lights, and allowing the gas to flow in, taking the time when it began to flow, and the time when I took my specimens. The flow of gas from the orifice, which we made in the experimental pipe in the trough, was at the rate of 10 feet per minute, as measured at the meter. The size of the orifice was 1¼ inch, or thereabouts, and the distance of it from the wall was 3 feet 1 inch. I took the atmosphere from midway between the window and the staircase in the basement, after the gas had been allowed to flow 3 minutes, 4 minutes, and 6 minutes. At 3 minutes, the proportion of gas to air was, as near as possible, 1 per cent.—rather under 1; at 6 minutes, it was 1.94—in fact, 2 per cent. No. 4 was not examined, as our apparatus broke. We did not repeat that experiment under a different pressure that morning. I was at Mr. Sturgeon's, taking the pressure upon several occasions, and I have also been there lately, taking the specific gravity of the Great Central gas. The pressure of the gas has varied from 11¼-10ths to 10-10ths, at the same hour as nearly as possible. It had then passed through the meter. It was tested in the usual way with the pressure-gauge. I did not notice, on those occasions, the extent of the escape. I made the experiments, referred to, at Uxbridge. The pressure used there was 10-10ths—where the gas flowed, to within a few yards of where the hole was made, the hole being the exact size, as I was told, of the hole that was in the pipe at the fire. The pressure which was 10-10ths at the meter, a few yards off was 8-10ths at the orifice. It was found that 55 cubic feet of gas flowed per minute, allowing for leakage and for burners, presuming that there were a number of burners being supplied with gas that morning. The escape was nearly 60 feet per minute, and we allowed 5 feet for leakage and burners, which I consider a large allowance. As the result of my experiments, I should have expected to find as near as may be 12 per cent. of gas in the air of the basement of the premises in Wood street, through the escape from the hole in the main on the morning of the fire, in the space of 6 minutes, instead of 1.94.

By the COURT—In the one case, the meter was only delivering gas at the rate of 10 feet per minute; whereas, in the other, it was delivered at the rate of from 55 to 60 feet. That difference would be caused by the size of the hole. We were afraid to make the hole so large as the original, for fear we should set fire to the neighbors. We wished to repeat the experiment on the same premises, but they said they had had enough of it.

By Mr. POLLOCK—Supposing the gas had been escaping at that rate for six minutes, with lights burning in the basement, there was quite sufficient to account for any explosion. Gas is a fluid which diffuses itself very readily. I have made experiments to try its power of diffusion through other substances. I made the experiments detailed by Mr. Siemans, at Uxbridge, and, besides those, we tried it by putting tow in the hole in the wall. We made two experiments—one with a large hole, and one with a lesser one. With the lesser hole—which was not more than 7 inches square, the wall being 3 feet 1 inch from the hole in the pipe—we found the gas exploded at 4½ feet beyond the wall. That was without the yarn. When the yarn was there, we found it explode within a foot beyond the wall, and within two minutes after the gas was turned on. The yarn was rammed tightly in the hole, and a small piece of spun yarn was tied on a stick, and lighted, and held within a foot of the back of the wall, when the gas ignited, showing that a sufficient quantity passed through to make an explosive mixture. That experiment was repeated twice, with the same result. The effect of the explosion was, that the fire rushed back to the orifice in the pipe. The gas exploded at about 8½ feet beyond the wall, when there was no tow in the hole—the circumstances being all precisely the same as to time, &c.

Cross-examined by Mr. BOVILL—The size of the hole in which the tow was put was, in one instance, 14 inches by 9, and, in the other, 7 inches square. In each instance, the hole was angular. The tow was in a round ball, and the man knelt down in the trench, and pushed it in with his hands. I did not see him use any other instrument. After it was put in, I looked to see if there was any daylight through it, but could not see any. The experiment was made in the way I have detailed, and the gas went through it, to my surprise, in a very short space of time.

Mr. BOVILL—Was it your opinion, before the experiment, that the gas would have passed through the tow that way?

Witness—I should have expected, in the course of time, that some would have passed through, even if it were in the open air; because, if you have a hole this distance, it will impinge upon the ends strongly, like a jet of water almost. The flow of gas is very strong.

Mr. BOVILL—Did you try whether there was any current of air through the hole?

Witness—We observed that there was no current of air through the hole. I tried it, in the first place, with a handkerchief, and, not being satisfied with that, I tried it with tissue-paper. That was just before the tow was put in.

Cross-examination continued—I was much surprised at the rapid manner in which the gas went through. I have not been called in at any gas explosions, but I have made many experiments on the subject. I had no difficulty, when the details of this fire were given me, to account for the explosion. I knew I was called in by the insurance office. I had no doubt the gas went down the area into the lower part of the premises; and, having made the experiment, I find that it would do so. There was no tar in the yarn we used; it was a perfectly clean piece of spun-yarn. I am not acquainted with the mode of laying services.

Re-examined by Mr. KARSLAKE—As far as I could ascertain, the hole was fully stopped before the experiment.

Dr. *Alphonse Normandy*, examined by Mr. KARSLAKE—I have practised for many years as an analytical chemist; I am a fellow of the Chemical Society, and have had great experience. I have studied the question of the diffusion of gas; it is a well-known property of that fluid. All gases diffuse with a peculiarity to each of them. I am also well acquainted with the tendency of gas to explode when mixed with a certain proportion of air. Before making any experiments in this case, I was practically acquainted with that quality in gas. I confirm the statements of other witnesses as to the proportions in which the explosive mixture is found. It ranges between 4 and 18 of air to 1 of gas. Those are the limits within which it ranges; 4 of air and 1 of gas, there is no explosion; 18 of air and 1 of gas, no explosion takes place; but between those limits, gradually, as you change the proportions, explosion takes place with the maximum of from 10 to 12 of air to 1 of gas, which proportions produce the most violent explosions. The proportions I have given are those of ordinary coal-gas; with purer gas, no doubt, the proportions would vary. I agree with the last witness as to the result of the experiments in Wood street. We did not use a very great pressure, nor an orifice of 1¼-inch diameter, on account of the annoyance which it would have caused in the neighborhood. I afterwards attended the experiments made at Uxbridge, where I understood that all things were arranged practically as in Wood street at the time of the fire. After having tried the experiment with the hole in the wall, 14 inches by 8, we diminished the size to 6 inches by 5, by blocking it up with bricks. With the larger hole, the gas ignited on the other side of the wall at a distance of 6 feet, roughly measured; and, when the hole was contracted, it lit at 5 feet 6 from the wall. It is obvious from this, that the gas was projected through the hole with a velocity due to the pressure in the main. Of course, the whole did not go through; it ascended.

By the COURT—There was a difference of half a foot only in the distance at which the gas ignited in the two holes.

By Mr. KARSLAKE—I witnessed the experiment made when the hole was stopped with tow. I knew before the experiment that no porous body would prevent the passage of gas; it would retard it, but not prevent it. I ascertained before the light was applied that the hole was properly stopped, and that no gas could pass through between the tow and the wall itself. I ascertained that it was fairly stopped simply by looking at it; there was no other experiment necessary to satisfy myself on the subject. I should say, as far as I can recollect, that the gas ignited in less than a minute. The effect was, that we heard a ramping noise; within a few seconds, the flame was on the other side of the wall, with a flash which caused a sheet of fire to rise some six feet high, which at once rushed to the hole in the pipe. The tow which was used was such a ball as is sold in the shops, and which in that form presents a more compact and impervious mass than if you were to take a bundle of tow and push it in. I agree with the last witness, that the escape of gas from a burner would not be sufficient to account for the explosion in Wood street. I calculated roughly, that the area of the basement story was about 4,000 cubic feet. I have not the vestige of a doubt that the gas came from the hole in the pipe, and formed an explosive mixture in that chamber. I witnessed the experiment for the purpose of ascertaining, when the glass doors of the basement were closed and the doors below the grating were open, whether there was an indraught into the building. I found there was a considerable indraught. It must be the case; and the first words I said on going into the establishment were, "It would surprise me if it were otherwise."

Cross-examined by Mr. BOVILL—Just as in a fireplace in ordinary circumstances, I should expect the smoke to go upwards. I should expect if a chimney-shaft were hot from a fire being constantly kept in, that the smoke would ascend; but if the chimney had been for a long time without a fire, it would not surprise me at all to see the smoke come down. A chimney, however, is not in the same condition as the chamber. The hole in the wall at Uxbridge was 14 inches vertical, and 8 inches lateral. The thickness of the wall was about 14 inches. I do not recollect the thickness of the wall of the house in Wood street. I was not surprised to find the gas go through the wall, when the hole was stopped with tow. I was surprised at the rapidity with which it traversed that solid mass, but I certainly expected it to go through, or else *cui bono* the experiment at all. I knew of my own previous knowledge that no porous body will prevent gas from passing. It depends upon how it was done, whether it would have made any difference if the tow had been tarred. If the ball was soaked in tar, or any other sticky substance, it would be much more impervious—perhaps altogether impervious. I should prefer mortar. We reduced the size of the hole in the wall by putting in bricks loosely, and then covering them with some mortar or lime, which was used for luting the retorts, in order to fill up the interstices: I saw the tow put in after that. There was as much force used as a man could use for the purpose. The hole was not interfered with as to size, and the tow was firmly put in. I looked, and saw that the hole was quite obstructed by the tow. I trusted to my eyes; they would not tell me how hard it was put in, but there are two ways of looking at a thing—a careful and a careless way. I looked carefully. I did not test it in any other way. I touched the tow, and pressed it with my hand before it was put in.

Re-examined by Mr. KARSLAKE—The experiment was a perfectly fair one.

Dr. *A. W. Hofmann*, F. R. S., examined by Mr. HAWKINS—I have for many years turned my attention to chemistry, and am acquainted with the properties of gas. I have heard the evidence of Dr. Normandy with reference to those properties, and as to what makes the most explosive mixture, and I agree with him. I witnessed the experiments at Uxbridge, of which he has given an account.

Mr. HAWKINS—Have you anything to add to his evidence?

Witness—Of course, in witnessing experiments, two persons see in some respects many things differently. In the main, I should think I have seen what Dr. Normandy has described in details. I may possibly have varied in my observations.

Mr. HAWKINS—Did you observe the tow that was put in the hole?

Witness—I was standing at the time on the wall, with the view of seeing what took place on both sides, and I confess I did not examine carefully the manner in which the tow was put in the hole. Owing to the position in which I was standing, I am unable to say anything particularly on that point. I wanted to see at what distance the gas took fire on the other side of the wall, and so I had placed myself in a position in which I could observe the orifice in the pipe from which the gas issued, and likewise the torch by which the gas was lighted. I observed, when the gas ignited, that the flame ran back to the pipe.

Cross-examined by Mr. Bovill—All these experiments require to be watched with a great deal of care. It is necessary to have not only two eyes, but eyes on both sides of the question.

Dr. *Miller* examined by Mr. Holland—I am a professor of chemistry at King's College. I have heard the evidence of Drs. Normandy and Hofmann, and I agree with what they have said in the main. I was present at the experiments at Uxbridge, and saw the tow put in the hole in the wall.

Lord Chief Justice Cockburn—Unless you dissent from Mr. Bovill's proposition, that tar makes all the difference, the experiment of the tow is of no avail, because the evidence of the defendant's witnesses will be that it was with tarred tow they stopped the hole. If Dr. Normandy is right, that tar would make all the difference—that it would make the tow impervious—the tow experiment may as well be dropped. [To Dr. Miller.] Do you agree in this, that gas issuing from one or even two ordinary burners in a space like this basement would not supply a sufficient quantity of gas, in proportion to the atmospheric air, to cause an explosion?

Witness—It is quite impossible, according to the statements which have been made.

The learned counsel consulted together at this stage of the proceedings for about half an hour; at the end of that time,

Mr. Bovill said—Will your lordship allow us to go into your room? Both sides are desirous to ask you one question.

Lord Chief Justice Cockburn—Certainly.

Mr. Bovill and Mr. Hawkins left the court with his lordship. On their return into court,

Mr. Bovill, addressing the jury, said—Gentlemen, I am happy to inform you that, in consequence of a communication that has passed, we have made an arrangement, which has been submitted to my lord, and which, I trust, will be satisfactory to everybody connected with the case. The terms we have arranged are for the payment of the sum of £25,000 by the defendants by certain instalments, which is less than half the amount claimed in any view of the case. We have stated the terms to his lordship, who approves of the same.

Lord Chief Justice Cockburn—I must say I think this is a result which will be satisfactory to every one; and both parties I think deserve commendation for having assented to such terms of arrangement. With regard to how this explosion and fire originated, I think, after the evidence we have heard, and from what I know in the main would be the evidence given on the other side, it is not possible to entertain the shadow of a doubt, for there are certain scientific facts and data which cannot be gainsaid or contradicted. The suggestion made that a burner or burners left unturned in the morning could have caused this explosion, is as much out of the question as it is possible to be But, with regard to the question whether there was negligence on the part of the company under the circumstances, that is one that is fairly open to discussion, and upon which there may be a difference of opinion; and I do not say which way the verdict of the jury would be likely in the end to be. Looking at all the circumstances, I think the defendants have acted most properly in agreeing to pay a certain amount; and I think also that the plaintiffs, who I understand to be substantially the insurance companies, though nominally they are the parties whose property was destroyed, have acted very wisely, and are very much to be commended for having moderated their demands, and accepted a smaller sum by way of arrangement and compromise. On the whole, I think the arrangement is a very satisfactory one to all concerned.

Mr. Hawkins—I may mention that this not only disposes of the two actions which had to be tried, but also of Blenkiron's.

The agreement entered into was as follows:

STURGEON AND ANOTHER, BLENKIRON AND MORLEY,
versus
THE GREAT CENTRAL GAS CONSUMERS' COMPANY, AND CLAIMS OF THE INSURANCE COMPANIES.

Juror withdrawn in each action; certificates for special juries. The defendants to pay £25,000, and costs to be taxed in each action. The costs to be paid within six months from this date. The defendants to pay £2 500—part of the £25 000—in six month from this date; £3 500—other part—in twelve months from this date; and the balance of the £25 000, by four equal instalments, on the 1st day of July in each of the following years—namely, 1863, 1864, 1865, and 1866.

Judge's Order, or Rule of Court, July 4, 1861.

(Signed) H. Hawkins, for Plaintiffs.
W. Bovill, for Defendants.

Water-Meters in Australia.—The following are the rates charged by the Bendigo Water-Works Company: For domestic purposes, supplied by half inch services, from 5 to 8 per cent. on the annual value of the premises; for trades and large consumers by meter, from 4s. to 5s. per 1,000 gallons; from the standpipes, 2s. per load of 100 gallons. The drainage area of these works is 700 acres.

Elmira, N. Y.—We will publish a sketch of the new water-works when completed, which will be in a short time.

THE ARTESIAN WELL AT PASSY.

On this subject M. Dumas, recently, read a highly interesting paper to the Academy of Sciences, in which he gave a history of the undertaking, and of the difficulties with which the engineer, M. Kind, has had to contend. The idea of boring this well originated with the necessity of providing pure and wholesome water for the population of Paris, which in a short time had increased from 1,200,000 souls to 1,700,000, thus materially augmenting the causes of infection to which the waters of the Seine are necessarily subject. Paris rests upon a stratum of chalk about 1,600 ft. in depth, covered with about 160 ft. of various strata of tertiary soil, and itself resting on nearly 160 ft. of marl or clay which is in contact with the green sands from which the well of Grenelle derives its supply. The successful boring of the latter had established the fact that the water which these sands received from localities at a distance from Paris might be made to rise to the surface, and even to 100 ft. or 125 ft. above. But the experiment had only been tried for bores not exceeding a diameter of from 8 in. to 1 ft., yielding a supply of from 450,000 to 1,000,000 imperial gallons of water per day. M. Kind came forward with an offer to bore a well of a diameter of 2 ft., yielding 3,050,000 gallons at an altitude of 82½ ft above the highest point of the Bois de Boulogne. Though limiting his promises to the yield above stated, he declared his conviction that it would reach 9,175,000 gallons, an assertion which most engineers considered exaggerated, deeming it highly improbable that an increase in the diameter would increase the supply. On the 23d of December, 1854, the works were resolved on, and the spot chosen in the neighborhood of the Bois de Boulogne, where the high temperature of the expected column of water might be turned to account. But the enterprise was fraught with difficulties which it required the unflinching perseverance of M. Kind to overcome; although, out of the 1,927 ft. which constitute the depth of the new well, there were scarcely 100 offering any serious obstacle, and these were situated in the clay either above or below the chalk stratum. On March 31, 1857, the bore had already reached 1,732 ft., and water was hourly expected, when suddenly the tube of sheet iron which supported the clay was crushed by its pressure at a depth of only 100 ft. from the top. This accident it took nearly three years to repair; a shaft of the depth of 175½ ft. had to be dug close to the bore, through all the most dangerous strata, and lined partly with sheet, and partly with cast iron and masonry. Its diameter was 10 ft. throughout the two-thirds of its depth, and 5 ft. 6 in. for the rest. It was a work of extreme difficulty. Cast-iron tubes, of the thickness of four-fifths of an inch, were starred or cracked in all directions, as if they were mere glass. More than once the workmen refused to risk their lives in this work, and the city engineers had to set the example of personal courage. This stupendous labor was not brought to an end before the 13th of December, 1859. The old orifice was then cleared, and the boring recommenced, and continued without any further accident to the dept of 1,804 ft., when the tube, composed of wood strongly hooped with iron, and ending in a bronze pipe, 6½ ft. of which were fitted into the wood, the remaining 40 ft. being free, stuck fast in such a way as to render all further progress nearly hopeless. However, M. Elie de Beaumont having, upon a mature examination of the specimens brought up by the borer, declared water to be close at hand, it was resolved that the bore should be continued with a small diameter, to be afterwards enlarged if necessary. Water was found for the first time at 1,894 ft., but, as we know, remained a few metres below the level of the orifice. A second tube, of sheet iron, 27½ in. in diameter, ¾ in. in thickness, and 170½ ft. in length, 40 ft. of which were loopholed in order to let the water pass, was sunk, and soon stopped in the clay. The boring was now resumed, to attain the largest diameter, until the 24th of September last, when M. Kind saw not only his promise fulfilled, but even his hopes, to a certain extent, realized. The bronze tube has remained where it was, but the concentric one of sheet iron has sunk to 1,246½ ft. M. Dumas here quotes M. Michal, Inspector-General of the Works of the City, who has arranged in a table the relative variations experienced up to the 2d inst. in the yield of the two wells of Passy and Grenelle; but on this score we have a later account, stating that the decrease in the latter does not exceed one-fourth of its yield prior to the 25th ult. On the 2d inst. that of the well at Passy was 4,412,500 gallons in twenty-four hours. M. Dumas attributes the diminution of the yield at Grenelle to a diminution of pressure, and is inclined to believe that when the tube at Passy shall have been brought to its normal altitude of 256 ft. above the level of the sea, the yield at Grenelle will again rise to its former figure, or nearly so. M. Elie de Beaumont has ascertained that the strata traversed at Passy are nearly the same as those met with at Grenelle. As to the chemical nature of the water at Passy, it seems, until further analysis, to be nearly the same as that of Grenelle; the temperature is also the same, viz., 82.4 deg. Fah. Whether other wells may be bored elsewhere in Paris without injury to the two existing ones is a question which experience alone can decide. The well at Passy has cost nearly £40,000, and will yield water sufficient for the wants of 500,000 inhabitants.

Messrs. Emanuel Turner & Co.'s Coals.—By a recent mail we received the last analyses of this firm's cannel and coal, which are as follows:

	Cannel.	Coal.
Gas, per ton at 60 per cent. turpentine,	c. f. 11,500	c. f. 11.000
Coke, per ton	cwt. 13.2.7	cwt. 13.1.16
Quality of Coke	Good.	Good.
Ammonia water	galls. 16	galls. 15¼
Tar	galls. 19	galls. 11¼
Illuminating power, 5-ft. burner	candles 22.50	candles, 14
Price per ton, f. o. b., in Liverpool	18s. 4d.	11s.

Messrs. Emanuel Turner & Co. have within a few months sold to the corporation of Manchester, England, 20,000 tons of cannel, and have contracted to supply the Buneos Ayres Gas-Light Company with all they will use, being the result of trials made of all the best cannels raised in Lancashire, price being a secondary consideration. This speaks well for their cannel.

Effect of Extreme Pressure upon Water.—The following experiments upon the effect of a pressure of three tons on the square inch upon water in hydraulic pipes or tanks are important, as bearing upon the correctness of the tests for insulation on covered telegraphic wires: *First experiment.*—Temperature of water in the well of the hydraulic pump, 62 deg.; temperature of the hydraulic pipe, containing the insulated wire, externally, 64 deg.; temperature of pipes, 65 deg.; temperature under pressure, 76 deg. *Second experiment, 8. p. m.*—Temperature of water in well, 62 deg.; temperature of pipes, 60 deg.; temperature under pressure, 76 deg. *Third experiment, 7 a. m.*—Temperature of water in well, 62 deg.; of water left in pipes over night, 61 deg.; temperature of pipes externally, 56.5 deg.; temperature of water after pressure, 70 deg. It appears from a work published in the early part of the present century, that the Florentine academicians filled a globe with water; this they compressed with a very violent force, and the act of compression was found to have considerably heated the water.—*Electrician.*

Subways for Gas and Water Mains.—At the opening meeting of the Institute of Architects, Mr. Tite, M. P., the president, said on this subject:—The subway was not a French invention. It was of English origin; and it was a pity that it was opposed; for had it not been so, Cannon street and all our new streets might have had it. The person who originally proposed it was, singularly enough, neither an architect nor a civil engineer, but a cheeseman, living in Whitechapel. That gentleman was the first to propose the plan to the corporation of the city of London; and the reason, and the sole reason, why it was not adopted, was the very obvious one, namely, an apprehension that as the gas-pipes were to be carried in the same subway with the sewer, an escape of gas might occur, and houses might, in consequence, be blown up. This objection had, however, since been got over, by adopting a careful and sufficient mode of ventilating the subway.—*London Builder.*

Bitumenized Gas and Water Pipes.—The Patent Bitumenized Water, Gas, and Drainage Pipe Company, of London, England, have invited subscriptions for their remaining capital of £30,000, for the extension of their works at Bow.

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Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities, and to improve the system of SEWERAGE, VENTILATION, HEATING, and DRAINAGE everywhere.

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THE
AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 1ST AND 15TH OF EVERY MONTH.

PROPRIETOR, JOHN B. MURRAY. | EDITOR, C. ELTON BUCK.

MONDAY, DECEMBER 16, 1861.

In the last issue of the JOURNAL we published an account of a gas explosion in Boston, Mass., which was attended with serious consequences, and from which two persons narrowly escaped with their lives. In the present number an accident from a similar origin is noticed, which occurred in Albany, N. Y. By a singular coincidence, we also publish, on another page, a portion of the legal proceedings against the Great Central Gas Company of London, England, for damages amounting to a large sum, claimed on account of the plaintiff's building having been destroyed by fire resulting from a gas explosion, directly attributable to the carelessness of the workmen of the company. These three casualties, occurring at different times, in different places, and resulting from a complication of circumstances materially unlike, afford striking evidence of the danger to be apprehended from negligence of precautions necessary to be observed in the use of gas, where, from some unforeseen reason, leakage is liable to occur. The circumstances under which these accidents happened were notably dissimilar, but the effects in two of them were remarkably alike—both inflicting personal injuries on the inmates of the respective houses; while the third resulted in a conflagration, which cost the Great Central Gas Company the not insignificant sum of One hundred thousand dollars damages, with costs in addition.

We presume that the question—how far a corporation is liable for injuries inflicted by its servants—is no longer a mooted point. In the case of railroads and similar corporate bodies, precedents enough have been cited to place this matter in its true light. As regards gas companies, but few cases of a nature resembling the one in question have occurred, but there is no reason why they should be exempt from similar judgments. The magnitude of the case just noticed will give it a pre-eminence among precedents of this character, and the circumstances attending the action will not be soon forgotten by members of the engineering profession, to whom the case appeals with more than usual prominence, as a result likely to occur in the routine of their own experience, unless their employees be duly warned of the dangers of such inadvertence as characterized the operations of the workmen of the Great Central Company in Wood street.

With regard to explosions in houses of consumers caused by their own heedlessness, or that of their servants, it remains with the gas companies to give such plain and explicit directions to be observed in the event of a leak occurring, that no accident can happen. As we have before remarked, a large majority of consumers are ignorant of the simplest rules of the distribution of gas, and their first impulse on noticing by the foul smell that gas is escaping, is to rush to the spot with a light, thus rendering an explosion imminent, and jeopardizing their lives in the most unwarrantable manner. If the danger were pointed out, and instructions given as to the proper means to be adopted when a leak is discovered, the common sense of the larger number of consumers, strengthened by their desire for personal safety, would suggest compliance with them. A few companies in this country have issued circulars to their consumers, explaining some of the most important facts necessary for them to know. It would be a wise policy for all to follow this example, and we feel convinced that, for whatever trouble and expense they might incur by so doing, they would be amply remunerated in the care which would be exercised by consumers over all the apparatus of the company in their own immediate premises.

These recent explosions should serve as a warning to consumers, and impress upon them the fact, that while in the use of illuminating gas they have an agent capable of affording a degree of comfort and convenience unknown before its introduction, yet through ignorance or carelessness they may convert it into an engine of devastation and ruin. Properly used, it is the cheapest, safest, and in all respects the best illuminator ever known, but when inadvertently employed, with imperfect apparatus and fixtures, it may entail irreparable loss, the blame of which will attach to the careless consumers alone, and cannot be urged as detrimental to the agent.

The force of the detonation of explosive mixtures of gas and atmospheric air is fearful. In the accidents referred to, the reports were heard at a great distance, resembling the thunder of artillery. The ruin wrought upon the houses in which the explosions occurred was great, and in one instance it will require a large outlay to make the necessary repairs. We hope we will have no more such casualties to record, but that the odium of dangerous illuminators may be attached solely to those "liquid infernal machines," burning-fluid, *et id omne genus*.

On page 204 of vol. 2, we had occasion to make some remarks on portable gas apparatus as used in steamboats, and we pointed out the dangerous form of gas-holder employed. These holders, which have received the condemnation of every student of the peculiar properties of gas, are still in use on a number of ferry-boats, as well as large river steamers. The accidents from explosions which we have just noticed ought to be held up as a monition to the owners of these vessels, who, if fatal catastrophes occur, will be visited by the indignation of the whole community for persisting in the use of a form of apparatus which is unquestionably dangerous, and the danger of which has been repeatedly affirmed. The apparatus which is generally adopted on the larger proportion of our railroads, for car illumination, is at once safe and convenient; and, apart from its safety, it possesses other advantages over the cumbersome sheet-iron gas-holders, withtheir India-rubber diaphragms, such as are employed on steamboats.

INFORMATION WANTED.

Inquiries respecting the Metropolitan Gas-Light Company of this city, are constantly being made of us by curious individuals, who desire to know something of its present condition, and whether it may be still considered a living corporation. Some incredulous persons who have interrogated us on this subject, incline to the belief that its existence is only mythical, and they class it with those nonentities which have occasionally been met with in the history of some other institutions. A short time ago this company sprang into existence with the promise of great vigor, giving assurances of wonderful benefits to be conferred upon the injured consumers of the existing gas-light companies, and promising to shine as a beacon to guide the hapless wayfarer from the troubled seas of present prices into the calm waters of cheap gas.

By a singular habit of association almost every question relating to the Metropolitan Gas-Light Company is coupled with a similar inquiry in reference to the Hydrogenated Fuel Company, which about a year ago took the good citizens of the metropolis by surprise at the grand flourish which heralded its birth, and the incalculable results which were to flow from the date of its inauguration. Whether the sympathies of these two gigantic corporations are congenial we know not, but rather imagine the contrary. However, by an ominous fatuity they seem to be always named together; but being the offspring of different parents, with widely different origins, and not being generally understood to entertain fraternal feelings for each other, their being grouped together in so unceremonious a manner, may be accounted for on the principle that extremes sometimes meet.

But whatever speculations be made as to their whereabouts, curiosity prompts the inquiry—Where can they be? Can it be possible that HERMANN has touched them with his prestidigitatorial wand and caused them to vanish into thin evanescent air? Or has a cabalistic agency more potent than HERMANN, touched them with a *golden* wand, and transfixed them forever? The potency of the necromancer's art is beyond question, but there exists a power still more vigorous, and commanding a more universal sway. Can it be possible that this agency has been invoked? We have heard it hinted, but then we could not believe such an imputation on the credit of mere rumor. Whatever be the present status of the corporations about which such curiosity exists, there is no doubt that some interest is manifested in the matter. Who will enlighten us?

BRITISH PATENT AGENCY.—Those of our readers who require the services of a patent agent resident in London will notice the advertisement of Messrs. Joseph Willcock & Co., whom we recommend as entitled to the confidence of inventors.

SOLID WOOD TRAYS.—Mr. R. G. Hunt replies to Mr. John L. Cheesman's statements, in the correspondents' column to-day. One or the other of these gentlemen has a valuable property in the patent for making these trays—the question appears to be, Whose is it?

STRATTON BROTHERS' GAS-WORKS.—The admirable gas-works of this well-known firm are advertised to-day. A pamphlet is in our possession containing several pages of names of our first citizens who have used their works with the greatest success, while at Christ's Church Hospital, Philadelphia, a very large building, Messrs. Stratton's gas-works are pronounced entirely satisfactory in every respect.

WALTON'S ANTI-FREEZING APPARATUS.—We hope none of the Northern gas-light companies whose mains are closed every winter by frost, will think of using this preventive. It is much more sensible to lose five hundred dollars worth of gas and annoy a whole neighborhood for a week by digging up the streets and filling the city with sulphur, than expend fifty dollars in keeping the pipes free.

BURNING OF A COAL-OIL MANUFACTORY.—Messrs. Rowley & Ashburner's coal-oil manufactory, in the Twenty-fourth ward, Philadelphia, was destroyed on Monday morning, December 9th, by fire, which caught accidentally. The loss has not been ascertained.

GAS STEALING IN SCOTLAND.—A man named Archibald Weir, a shoemaker, of Leith, Scotland, was lately charged before the Police-court with stealing gas from the Edinburgh Gas-Light Company. He pleaded guilty to the charge, and was sentenced to sixty days imprisonment.

ANSWERS TO CORRESPONDENTS.

F. J. E., of N. H.—*The use of alcohol for filling wet meters in cold weather is objectionable, on account of its liability to become converted by fermentation into acetic acid, which readily acts on the metal work of the meter. You will find an interesting article on the subject of fluids for wet meters on page 192 of Vol. 2.*

A. B. S., of Ind.—*Fifteen candle gas may be considered as doing very well. If you are sure you conduct your photometrical experiments with care, and are accurate in your determinations, your mixture of coals is judiciously made.*

R. L., of Cal.—*The principal objection to the use of aniline as a dye, is its want of permanency. It will fade, and thus lose its effect. A number of chemists have endeavored to make it a fast color, and some claim to have been successful. We believe it will be accomplished, and that it will become a very important article of trade.*

O. H. G., of Ohio.—*There is nothing new in the idea of naphtholizing gas. The recent patents have been more for improved forms of apparatus than for any novelty in the principle of imparting brilliancy to the flame. More than a dozen substances have been used for this purpose.*

Tyro.—*Toluol is one of the products of the destructive distillation of coal, as well as of rosin, wood, and fat oils. Its formula is* C_{14} H_8. *Its odor is etherial, resembling that of benzol. Its specific gravity, according to Couerbe, is* 0.821, *while Pelletier and Walter make it* 0.86. *Toluol is insoluble in water, but imparts its odor to that liquid. It is sparingly dissolved by alcohol; but much more readily by ether. It acts as a solvent to most of the resins. It may also be prepared from petroleum, and Burmese naphtha, or Rangoon tar.*

CORRESPONDENCE.

THE WATER-GAS.

Office La Crosse City Gas-Light Company,
La Crosse, Wis., Nov. 8th, 1861.

To the Editor of the American Gas-Light Journal:

I notice an observation in your isssue of November 1st, with reference to our works being altered to adopt the water-gas. Such is not the case. We have made no change in our intentions, and are finishing the works according to original designs.

Respectfully yours,
J. S. Seller, Suptd.

Conically Slotted Solid Wood Sieves for Gas Purifiers.

Mr. Hunt defines his position.

New York, Dec. 6, 1861.

To the Editor of the American Gas-Light Journal:

In order that my rights in the matter of solid wood trays for gas purifiers may be more thoroughly understood by the public, I beg leave to say, through the medium of your Journal—

1st. That my letter on page 137 does not say that I have obtained a patent for the sieve itself as stated in your editorial columns, page 168, last issue.

2d. That the Patent Office has granted me, as stated in said letter, a patent which bears date July 23d, 1861, for the machine used for making the sieves, and has also granted me a patent for the sieve itself, not yet *issued*, or *ordered to issue*, but which *I can have issued* at any time I see fit to take it, within the next year.

3d. That the interference between my application and the application of Wm. Coombe for the patent, for the sieve, was long since decided in my favor, and the decision rejecting the application of Coombe outright, and allowing me a patent for the seive, reported in your columns, page 74.

Because the Patent Office, acting through the Examiner who had charge of the case, rejected one of the claims I made, I took an appeal to the Chief Examiner in order to get that claim, but can take the patent as it stands at any time, by striking out that particular claim.

4th. No appeal was entered by the attorney for the Coombe application within the 30 days allowed for entering such appeal. The Coombe application is therefore abandoned.

5th. My letter on page 137 had the good effect to cause one of the advertising infringers of my inventions to withdraw the statement that he was manufacturing "my patent" solid wood trays, and state that he is manufacturing under the Coombe invention.

6th. I am only waiting for my second patent, to put the infringers through, by a suit under both patents, but if I don't get the second patent, as I want it pretty soon, I shall commence with the manufacturing in fringers who are using my machine patent.

7th. All persons are cautioned against a form of my sieve, sometimes called "a diamond bar sieve," which I understand some of the infringers are slyly exhibiting and endeavoring to get orders for, and I should not wonder if they would have the impudence some of these days, to advertise it as "my patent" sieve.

R. G. Hunt, 631 Fourth st., N. Y.

REPORTS OF GAS INSPECTORS.

BALTIMORE, MD.

For the week ending November 28, 1861.

Illuminating power, in Candles.	Sulphur, grs. in 100 cubic feet.	Ammoniacal Gas.	Sulphuretted Hydrogen Gas.	Carbonic Acid Gas.	Pressure in Main, Maximum.	Pressure in Main, Minimum.	Burning pressure during trial of Gas.	Bromine condensation per cent.
13.9	less than 5 grains.	greatly in excess	none	none	$\frac{3}{10}$	$\frac{2}{10}$	$\frac{2}{10}$	4.25

William E. A. Aikin,
Inspector of Illuminating Gas.

REMARKS.

The gas is still above the standard fixed by the ordinance, but decidedly inferior to the supply of a few weeks back. On Monday and Tuesday last it was down to 12.8 candles. The pressure still continues to be much more carefully managed. The extreme limit of variation on some days has been less than half an inch.

For the week ending December 5, 1861.

Illuminating power, in Candles.	Sulphur, grs. in 100 cubic feet.	Ammoniacal Gas.	Sulphuretted Hydrogen Gas.	Carbonic Acid Gas.	Pressure in Main, Maximum.	Pressure in Main, Minimum.	Burning pressure during trial of Gas.	Bromine condensation per cent.
13.9	less than 5 grains.	in excess.	none	none	$\frac{3}{10}$	$\frac{2}{10}$	$\frac{2}{10}$	4.25

William E. A. Aikin,
Inspector of Illuminating Gas.

REMARKS.

The quality of the gas seems gradually approaching the limit fixed by the city ordinance. The lowest illuminating power during the past week occurred on Tuesday last, when it stood at 12.6 candles. The pressure continues to be very carefully managed.

Dr. J. Northcote Vinen to the Surrey Consumers' Company of London, Eng.

1861. Week ending.	Number of Observations.	Maximum Light, Candles.	Minimum Light, Candles.	Average Light, Candles.
Oct. 19,	4	13.75	11.81	13.01
" 26,	4	14.59	13.13	13.97
Nov. 2,	4	14.15	12.82	13.28

The volume of hydrocarbons averaged 3.7 per cent.; carbonic acid, 1 per cent.; sulphuretted hydrogen and ammonia, none. The maximum pressure was $3\frac{2}{10}$ths inches—the minimum $\frac{6}{10}$ths. The ordinary working pressure averaged 1 inch. During the twelve months ending on the 29th of September, the actual number of observations made on the illuminating power of the Surrey Consumers' Company was 1810. In the quarter ending December 26th, 1860, the average light was equal to 13.54 candles. In the quarter ending March 28th, 1861, the average was 13.49 candles. Quarter ending June 29th, 14.64 candles. Quarter ending September 28th, 12.90 candles. The volume of hydrocarbons for this period varied between 4 and 6 per cent. No sulphuretted hydrogen was detected. Ammonia was present in quantity up to August, since when it has disappeared.

Gas-Works in British Guiana.—Mr. S. R. Dickson will sail for British Guiana, Demarara, about January 1, for the purpose of building a gas-works there. The capital of the company is $150,000 and the works will cost nearly that sum as they are intended to be of the first order. Twelve miles of pipe will be laid at once; the English bitumenized paper pipes will probably be used, if they can be shown to be suitable. Some 200 public lamps are engaged and a valuable charter has been granted to Mr. Dickson, whose enterprise deserves success.

COAL-GAS.*

The manufacture of coal-gas is an admirable example of the benefits conferred by chemistry in all the three divisions of its uses; for it not only has economized human power and time, but it has utilized all the products employed in removing its impurities. Coal-gas was only introduced to use at the beginning of this century, and the public prejudice which had to be overcome, and the difficulties to be surmounted in its actual manufacture, may still be remembered by many of my hearers. It was no mean innovation to replace tallow candles and oil lamps by an air streaming through pipes, but the difficulties attending its purification from noxious ingredients appeared even more insuperable than to reconcile the public to the innovation: the gas had an insupportably fœtid odor, and certainly injured health when burned; it discolored the curtains, tarnished the metals, eat off the backs of books, and covered everything with its fuming smoke. It required a man of courage, as indomitable as Winsor, its great advocate, to persuade the public to continue its use until means were found for the removal of these noxious qualities. Here chemistry, itself the father of the manufacture, was called in consultation. The impurities in the gas are sulphuretted hydrogen, which tarnished the metals, and with sulphuret of carbon produced sulphureous fumes; ammoniacal compounds, which changed the colors of dyes and acted on leather; tarry vapors, which caused the deposition of soot; and all these had to be removed. The ammonia and the tar were partially condensed in tubes kept cool, the sulphuretted hydrogen and carbonic acid were removed by lime, and the ammonia by washing the gas with water. This last operation was the least effective, and new substitutes had to be devised, one of which I may mention; superphosphate of lime, consisting of bones dissolved in sulphuric acid, only required ammonia to make it a powerful and excellent manure; trays of this superphosphate were therefore placed in a chamber through which the gas passed, and thus the ammonia was removed, while the phosphate became enriched. A new method is now extensively employed, and shows the tendency to simplification resulting from discovery. By this method almost all the conditions of purification are satisfied by one process; the gas, after cooling, is at once taken into a chamber containing carbonate of lime and sulphate of iron; these, reacting upon each other, produce oxide of iron and sulphate of lime. The gas, streaming through this mixture, gives up its sulphuretted hydrogen to the oxide of iron, while the carbonate of ammonia, decomposing the lime salt, forms sulphate of ammonia and carbonate of lime, the lime thus being reconverted to its original state; the gas before being passed into this mixture is occasionally led through chloride of calcium in order to aid the removal of the ammoniacal salt. When the mixture has done its work it is exposed to air, and the sulphide of iron absorbing oxygen is converted into a basic sulphate of iron; hence the mixture is similar in its purifying character, except that it contains sulphate of ammonia, which may be washed out and preserved, while the residue is employed over and over again. By this elegant process the noxious sulphur compounds are utilized in the fabrication of sulphate of ammonia, and the mixture seems never weary of performing its duty; hence not only is the purification performed at one process, but the noxious ingredients are converted into compounds of much value. The waste and badly-smelling products of gas-making appeared almost too bad and fœtid for utilization, and yet every one of them, chemistry, in its thriftiness, has made almost indispensable to human progress; the badly-smelling tar yields benzole, an ethereal body of great solvent powers, well adapted for preparing varnishes, used largely for making oil of bitter almonds, of value for removing grease-spots, and for cleansing soiled white kid gloves. The same tar gives naphtha, so important as a solvent of India rubber and gutta percha; similar tar, when made from wood, yields creosote, a powerful preservative of animal matter, and much employed as a medicinal agent. Coal-tar furnishes the chief ingredient of printer's ink, in the form of lampblack; it substitutes asphalte for pavements; it forms a charcoal

* Extract from the lecture of Dr. Lyon Playfair, on the chemical principles involved in the manufactures of the Great Exhibition of 1851.

when mixed with red-hot clay, that acts as a powerful disinfectant. When the tar is mixed with the coal-dust, formerly wasted in mining operations, it forms by pressure an excellent and compact artificial fuel; the water, condensed with the tar, contains much ammonia, readily convertible into sulphate of ammonia, a salt now recognized as being of great importance to agriculture, and employed in many of the arts. Cyanides are also present among the products of distillation, and these are readily converted into the beautiful color known as Prussian blue. The naphthaline, an enemy to the gas-manufacturer by choking the pipes, may be made into a beautiful red coloring matter, closely resembling that from madder. This, by its transformation, promises an important, though hitherto not yet realized useful product. Coal, when distilled at a lower temperature than that required to form gas, produces an oil containing paraffine, largely used as an antifrictional oil for light machinery.

ON THE ACTION OF WATER ON LEAD.

By Dr. F. Crace Calvert.*

I would not have troubled this section with bringing before them a subject which has been noticed by them several times already, if these researches (which were made in connection with a select committee of the Sanitary Association of this city) had not presented some interest on several points—namely, the action on lead of a water supplied to a large population; the determination of the quantity of lead that the same water took up in a given length of time; and, further, with the hope of removing from the minds of some chemists the impression that soft water does not act upon lead.

These experiments have extended over a period of more than twelve months, and above 300 samples of water have been tested, and led to the following conclusions:—

First, that the water supplied to Manchester, and passing through a lead pipe used as a supply pipe, was for four days highly charged with lead compounds, and that the quantity gradually decreased for six weeks when the water ceased to absorb lead. But if, during that period, the water were allowed to remain in contact with the pipe for twelve hours, its action was still very marked; and it may be stated that, at the end of six weeks, the water still contained $\frac{2}{10}$ths of a grain of lead per gallon, and after three months $\frac{1}{30}$th of a grain was found.

Secondly, experiments were made on five samples of piping, of the following description:—No. 1, extra tinned lead piping; No. 2, ordinary tinned lead piping; No. 3, best or virgin lead piping; No. 4, common lead piping; No. 5, block tin piping. The water was left in contact with these pipes for twelve hours, and, with the exception of the one last mentioned, all were acted on, the proportion of lead taken up by the water from the lead pipes amounting to from $\frac{1}{10}$th to $\frac{3}{10}$ths of a grain per gallon. Waters containing these quantities of lead per gallon are quite sufficiently charged with that compound to prove injurious to health if used as a beverage. I may substantiate this statement by the fact that four samples of water, which I have lately examined as having injured the health of the inhabitants of this city, contained from $\frac{1}{10}$th to $\frac{3}{10}$ths of a grain of lead per gallon. Therefore there can remain no doubt that the water of this city may become sufficiently charged with lead to injure the health of the inhabitants.

Dr. Crace Calvert concluded his remarks by stating that, on allowing water to remain for some time in the pipes, and then again bringing them into constant use, the action of the water on the pipes is greatly increased.

In the discussion which followed,

Dr. Smith, of Sydney, said, from experiments he had made at Sydney, he found that the action of water upon pipes made of lead and tin was much greater than its action on lead alone.

A gentleman said that he had found that the water of Sheffield, which came from a similar source as that of Manchester, was strongly contaminated by passing through lead pipes, being to the extent of $\frac{2}{10}$ths to $\frac{3}{10}$ths of a grain per gallon.

Dr. Angus Smith related several instances of serious poisonings, and even deaths, through drinking Manchester water. Though the Glasgow water was said not to be injurious to health, he believed as little as $\frac{1}{40}$th of a grain of lead per gallon would affect many persons, while others might not be affected by $\frac{1}{10}$th.

Dr. Macadam said the water of Edinburgh was impregnated with lead only to the extent of $\frac{1}{40}$th of a grain per gallon.

Dr. Wallace said that he believed the cause of the action of the water upon the lead was oxygen and nitric acid. Lime, also, exercised a powerful action in permitting the action of the water upon the lead. He had heard of no poisonings in Glasgow by the water.

*Read before the British Association for the Advancement of Science.

STATE OF NEW YORK.

Revised Statutes Vol. II., Page 726, Vol. II., Title 15, Sec. 1-27.

An Act to authorize the formation of Gas-Light Companies.

COMPANIES—HOW TO BE FORMED.

Section 1st. Any three or more persons, who may desire to form a Company for the purpose of manufacturing and supplying gas for lighting the streets, and public and private buildings of any city, village, or town in this State, may make, sign, and acknowledge, before some officer competent to take the acknowledgment of deeds, and file in the office of the clerk of the county in which the business of the Company shall be carried on, and a duplicate thereof in the office of the Secretary of State, a certificate in writing, in which shall be stated the corporate name of the said Company and the objects for which the Company shall be formed, the amount of the capital stock of said Company, the term of its existence, not to exceed fifty years, the number of shares of which the said stock shall consist, the number of directors and their names, who shall manage the concerns of said Company for the first year, and the names of the town and county in which the operations of the said Company are to be carried on.

THEIR POWERS AS BODIES CORPORATE.

Section 2d. When the certificate shall have been filed as aforesaid, the persons who shall have signed and acknowledged the same, and their successors, shall be a body politic and corporate, in fact and in name, and by the name stated in such certificate; and by that name have succession, and shall be capable of suing and being sued in any Court of law or equity in this State; and they and their successors may have a common seal, and may make and alter the same at pleasure; and they shall, by their corporate name, be capable in law of purchasing, holding, and conveying, any real and personal estate whatever, which may be necessary to enable the said Company to carry on the operations named in such certificate, but shall not mortgage the same or give any lien thereon.

AFFAIRS—HOW MANAGED.

Section 3d. The stock, property, and concerns of such Company shall be managed by not less than three nor more than nine Directors, who shall respectively be stockholders in such Company, and citizens of the United States, and a majority of whom shall be residents of this State, and who shall, except the first year, be annually elected by the stockholders, at such time and place as shall be directed by the by-laws of the Company, and public notice of the time and place of holding such election shall be published not less than ten days previous thereto, in a newspaper printed in the place where the operations of the said Company shall be carried on, and the election shall be made by such of the stockholders as shall attend for that purpose, either in person or by proxy. All elections shall be by ballot, and each stockholder shall be entitled to as many votes as he owns shares of stock in the said Company, and the persons receiving the greatest number of votes shall be Directors; and when any vacancy shall happen among the directors, by death, resignation, or otherwise, it shall be filled for the remainder of the year in such manner as may be provided for by the by-laws of the said Company.

PROVISION IN CASE OF NEGLECT TO ELECT DIRECTORS.

Section 4th. In case it shall happen at any time, that an election of Directors shall not be made on the day designated by the by-laws of said Company, when it ought to have been made, the Company for that reason shall not be dissolved, but it shall be lawful on any other day to hold an election for Directors, in such manner as shall be provided for by the said by-laws; and all acts of Directors shall be valid and binding as against said Company, until their successors shall be elected.

PRESIDENT AND SUBORDINATE OFFICERS.

Section 5th. There shall be a President of the Company, who shall be designated from the number of the Directors, and also such subordinate officers as the Company by its by-laws may designate, who may be elected or appointed, and required to give such security for the faithful performance of the duties of their office, as the Company by its by-laws may require.

CALLS MAY BE MADE ON STOCKHOLDERS.

Section 6th. It shall be lawful for the Directors to call in and demand from the stockholders respectively, all such sums of money by them subscribed, at such times and in such payments or installments as the directors shall deem proper, under the penalty of forfeiting the shares of stock subscribed for, and all previous payments made thereon, if payment shall not be made by the stockholders within sixty days after a personal demand, or notice requiring such payment shall have been published for three successive weeks, in any newspaper in the place where the business of the Company shall be carried on as aforesaid.

BY-LAWS MAY BE MADE.

Section 7th. The Directors of such Company shall have power to make such prudential by-laws as they shall deem proper for the management and disposition of the stock and business affairs of such Company, not inconsistent with the laws of this State, and prescribing the duties of officers, artificers, and servants, that may be employed; for the appointment of all officers, and for carrying on the business aforesaid.

STOCK TRANSFERABLE.

Section 8th. The stock of such Company shall be deemed personal estate, and shall be transferable in such manner as shall be prescribed by the by-laws of the Company.

COPY OF CERTIFICATE EVIDENCE.

Section 9th. A copy of any certificate of incorporation, filed in pursuance of this act, certified by the county clerk or his deputy to be a true copy, and of the whole of such certificate, shall be received in all Courts and places, as presumptive legal evidence of the incorporation of such Company, if the same shall comply with the provisions of this act.

LIABILITY OF STOCKHOLDERS.

Section 10th. All the Stockholders incorporated under this act, shall be severally individually liable to the creditors of the Company in which they are Stockholders, to an amount equal to the amount of stock held by them respectively, for all debts and contracts made by such Company, until the whole amount of capital stock fixed and limited by such Company, shall have been paid in, and a certificate thereof shall have been made and recorded as prescribed in the following section, and the capital stock so fixed and limited shall all be paid in, one half thereof within one year, and the other half within two years from the incorporation of said Company, or such corporation shall be dissolved.

CERTIFICATE OF PAYMENT OF STOCK TO BE FILED.

Section 11th. The President and a majority of the Directors, within thirty days after the payment of the last installment of the capital stock so fixed and limited by the Company, shall make a certificate stating the amount of the capital so fixed and paid in; which certificate shall be signed and sworn to by the president and a majority of the Directors; and they shall, within the said thirty days file the same in the office of the county clerk of the county wherein the business of the said Company is carried on.

COMPANIES TO MAKE AN ANNUAL REPORT.

Section 12th. Every such Company shall make a report annually within twenty days from the first day of January, which shall be published in some newspaper published in the city, village, or town, where the business of said Company is carried on, of the amount of capital, and of the proportion actually paid

in, and the amount of its existing debts, which report shall be signed by the President and a majority of the Directors, and verified by the oath of the President and Secretary of the Company; and if any of said Companies shall fail so to do, all the Directors of the Company failing so to do, shall be jointly and severally liable for all the debts of the Company then existing, and for all that shall be contracted before such report shall be made.

PROVISION RESPECTING DIVIDENDS.

Section 13*th*. If the Directors of any such Company shall declare and pay any dividend when the Company is insolvent, or any dividend the payment of which would render it insolvent, or which would reduce the amount of their capital, they shall be jointly and severally liable for all the debts of the Company then existing, and for all that shall be thereafter contracted, so long as they shall respectively continue in office; *provided*, that if any of the Directors shall at any time before the time fixed for the payment of such dividend object thereto, and shall, within thirty days thereafter, file a certificate of their objection in writing with the clerk of Company, and with the clerk of the county, they shall be exempt from the said liability.

PROVISION RESPECTING FALSE REPORTS OR CERTIFICATES.

Section 14*th*. If any certificate, report made, or public notice given by the officers of any such Company, in pursuance of the provisions of this act shall be false in any material representation, all the officers who shall have signed the same knowing it to be false, shall be jointly and severally liable for all the debts of the Company, contracted while they are stockholders or officers thereof.

LIABILITY FOR DEBTS.

Section 15*th*. The stockholders of any Company organized under the provisions of this act, shall be jointly and severally individually liable for all debts that may be due and owing to all their laborers, servants, and apprentices, for services performed for such corporation.

RIGHT TO ALTER, AMEND, OR REPEAL.

Section 16*th*. The Legislature may at any time alter, amend, or repeal this act, or may annul or repeal any incorporation formed or created under this act; but such amendment or repeal shall not, nor shall the dissolution of any such Company, take away or impair any remedy given against such corporation, its stockholders, or officers, for any liability which shall have been previously incurred.

PROVISION RESPECTING DEBTS NOT PAYABLE WITHIN ONE YEAR.

Section 17*th*. No stockholder shall be personally liable for the payment of any debt contracted by any Company formed under this act, which is not to be paid within one year from the time the debt is contracted, nor unless a suit for the collection of such debt shall be brought against such Company within one year after the debt shall become due; and no suit shall be brought against any stockholder who shall cease to be a stockholder in any such Company, for any debt so contracted, unless the same shall be commenced within two years from the time he shall have ceased to be a stockholder in such Company, nor until an execution against the Company shall have been returned unsatisfied in whole or in part.

POWER TO MANUFACTURE AND SELL GAS.

Section 18*th*. Any corporation formed under this act shall have full power to manufacture and sell, and to furnish such quantities of gas as may be required in the city, town, or village, where the same shall be located for lighting the streets, and public and private buildings, or for other purposes; and such corporation shall have power to lay conductors for conducting gas through the streets, lanes, alleys, and squares, in such city, village, or town, with the consent of the municipal authorities of said city, village, or town, and under such reasonable regulations as they may prescribe; and the said municipal authorities shall have power to exempt any corporation formed under the provisions of this act, from taxation on their personal property, for a period not exceeding three years from the organization of said corporation.

PENALTY.

Section 19*th*. Any person wilfully injuring, or causing to be injured any property of any corporation created under this act, shall forfeit and pay to the said corporation treble the amount of damages sustained by such injury, to be recovered in any Court having cognizance thereof.

CAPITAL STOCK MAY BE INCREASED OR DIMINISHED.

Section 20*th*. Any Company which may be formed under this act, may increase or diminish its capital stock, by complying with the provisions of this act, to any amount which may be deemed sufficient and proper for the purposes of the corporation. But before any corporation shall be entitled to diminish the amount of its capital stock, if the amount of debts and liabilities shall exceed the amount of capital to which it is proposed to be reduced, such amount of debts and liabilities shall be satisfied and reduced so as not to exceed such diminished amount of capital; and any existing Company heretofore formed under any special act, may come under and avail itself of the privileges and provisions of this act, by complying with the following provisions, and thereupon such Company, its officers, and stockholders, shall be subject to all the restrictions, duties, and liabilities, of this act.

GENERAL MEETING OF STOCKHOLDERS TO INCREASE OR DIMINISH STOCK.

Section 21*st*. Whenever any Company shall desire to call a meeting of the stockholders for the purpose of availing itself of the privileges and provisions of this act, or for increasing or diminishing the amount of its capital stock, or for extending its business, it shall be the duty of the directors to publish a notice signed by at least a majority of them in a newspaper in the county, if any shall be published therein, at least three successive weeks, and to deposit a written or printed copy thereof in the post-office, addressed to each stockholder at his usual place of residence, at least three weeks previous to the day fixed upon for holding such meeting, specifying the object of the meeting, the time and place, when and where such meeting shall be held, and the amount to which it shall be proposed to increase or diminish the capital, and the business of such Company so extended; and a vote of at least two-thirds of all the shares of stock shall be necessary to an increase or diminution of its capital stock, or the extension of its business as aforesaid, or to enable a Company to avail itself of the provisions of this act.

MEETING—HOW ORGANIZED AND BUSINESS CONDUCTED.

Section 22*d*. If, at any time and place specified in the notice provided for in the preceding section of this act, stockholders shall appear in person or by proxy, in number representing not less than two-thirds of all the shares of stock of the corporation, they shall organize by choosing one of the directors chairman of the meeting, and also a suitable person for secretary, and proceed to a vote of those present, in person or by proxy, and if on canvassing the votes it shall appear that a sufficient number of votes has been given in favor of increasing or diminishing the amount of capital, or of extending its business as aforesaid, or of availing itself of the privileges and provisions of this act, a certificate of the proceedings showing a compliance with the provisions of this act, the amount of capital actually paid in, the whole amount of debts and liabilities of the Company, and the amount to which the capital stock shall be increased or diminished, shall be made out, signed, and verified, by the affidavit of the chairman, and be countersigned by the secretary; and such certificate shall be acknowledged by the chairman, and filed as required by the first section of this act, and when so filed, the capital stock of such corporation shall be increased or diminished, to the amount specified in such certificate, and the business extended as aforesaid, and the Company shall be entitled to the privileges and provisions, and be subject to the liability of this act, as the case may be.

GENERAL POWERS.

Section 23*d*. Every corporation created under this act shall possess the general powers and privileges, and be subject to the liabilities and restrictions contained in title third of chapter eighteen of the first part of the Revised Statutes.

PENALTY FOR INTENTIONALLY MAKING PIPES, &C., AROUND METER PROVIDED FOR REGISTERING QUANTITY GAS CONSUMED.

Section 24*th*. Any person who, with intent to injure or defraud any gas Company, body corporate, or individual, shall make or cause to be made, any pipe, tube, or other instrument, or contrivance, or connect the same, or cause it to be connected with any main service pipe, or other pipe for conducting or supplying illuminating gas, in such manner as to connect with, and be calculated to supply illuminating gas to any burner or orifice, by or at which illuminating gas is consumed, around or without passing through the meter provided for the measuring and registering the quantity of gas there consumed, shall be deemed guilty of a misdemeanor, and upon conviction, shall be punished by imprisonment not exceeding six months, and by fine not exceeding two hundred and fifty dollars. (1854, Ch. 109, § 1.)

PENALTY FOR WILFULLY INJURING, &C., METER AT ANY BURNER, &C.

Section 25*th*. Any person who, with intent to injure or defraud any gas Company, body corporate, or individual, shall wilfully injure, alter, or obstruct, or prevent the action of any meter provided for the purpose of measuring and registering the quantity of illuminating gas consumed by or at any burner, orifice, or place, or cause or procure any such meter to be injured or altered, or the action thereof to be obstructed or prevented, shall be deemed guilty of a misdemeanor, and upon conviction, shall be punished by imprisonment not exceeding six months, and by fine not exceeding two hundred and fifty dollars. (Same Ch., § 2.)

DIRECTORS AUTHORIZED TO ISSUE BONDS.

Section 26*th*. The directors of any corporation formed under the act entitled "An Act to authorize the formation of Gas-Light Companies," shall have power to issue bonds to an amount not exceeding one-third of the capital stock actually paid in, for a period not exceeding twenty years, and bearing an interest not exceeding seven per cent. (1854, Ch. 313, § 1.)

PROCEEDS OF BONDS—HOW APPLIED.

Section 27*th*. The proceeds of all bonds issued by authority of the foregoing section shall be applied to the extension or enlargement of the works, and the purchase of real estate required for the use of the corporation. (Same Ch. § 2.)

GAS EXPLOSION IN ALBANY, N. Y.—On Friday afternoon, December 6th, a violent explosion of gas occurred in a building on the corner of Lydius street and Broadway, Albany, N. Y. The building, which was occupied in part by a man named Donnelly, was, during the day, found to be almost untenable from the escape of gas. Mr. Donnelly, who was absent during the greater part of the day, returned about 4 o'clock, when he at once threw open the doors of the first floor, and also opened the door leading to the cellar, and then sent to the office of the gas company for some one to call and investigate the cause of the escape of gas A man named Smith was immediately dispatched to the building to ascertain the cause of the leak and repair any damage he might discover. He entered the cellar in company with another person, when either he or the person accompanying him lighted a match, (which, it is not known,) but soon after an explosion occurred, which fairly shook the earth, and made a report similar to the discharge of a cannon.

The entire interior of the building was demolished, the counters, ceilings and partitions being thrown down. A very general destruction of everything but the outer walls resulted. Families in the second and third stories were suddenly thrown violently about to the great derangement of their personal and household effects Indeed, one person, an occupant of the third floor, states that he was thrown against the ceiling while seated at a table, and fell a distance of eight or ten feet, among a pile of rubbish. Several persons in the next building south, were also thrown off their feet and with great force against the walls of the room in which they were, so great was the power of the explosion. The building was soon on fire, and the alarm spreading, Engine 8 was soon on the ground, and, getting a stream on, speedily subdued the flames.

The first floor of Donnelly's house was completely shattered, the front being blown out, as also the contents of the room. Every pane of glass in the building was broken, and every timber more or less damaged. Mrs. Donnelly was nursing a young child, about eight months old, when the explosion occurred. It was blown out of her arms and considerably bruised, besides being somewhat burned.

The greatest destruction was in the building on

Broadway, occupied by Linnen. The cellar extends under both buildings, and was used in common. The first and second stories of the building are a mass of ruins, and the front of the building completely wrecked. Mrs. Linnen and family were in the second story at the time of the explosion, and were buried in the ruins.

Mrs. Linnen was found to be injured in the knee, but not seriously. Her daughter, a child six years of age, presented a shocking appearance. One of her legs was very badly shattered, and the bone protruded through the flesh above the knee. Another child of Mrs. Linnen was also considerably bruised, but not seriously. Physicians were summoned and were soon in attendance upon the sufferers. It was found necessary to perform a delicate operation upon the child of Mrs. Linnen. Several pieces of bone were removed, and to straighten the leg it became necessary to cut off about two inches of the bone. The surgeons think it may yet be necessary to amputate the limb.

The man Smith, in the employ of the gas company, was blown towards the door, and escaped into the street, severely burned about the hands, head, and face. His companion escaped uninjured.

The cause of the escaping of the gas is attributed to the fact that Donnelly had been taking in coal, which had been thrown on the gas-pipe in the cellar, thereby breaking it.

COLLIERY EXPLOSION IN ENGLAND.—A shocking colliery explosion has recently occurred at the Prince Albert coal-pit, Shevington, England, by which eleven lives were lost. The pit is about 800 feet deep, and on the south side of the workings twenty men were employed. At half past nine o'clock in the morning on which the accident occurred, the workmen were startled by a loud explosion of fire-damp, which seemed to take place nearer the shaft than where most of them were working. Many were severely scorched, but a large number succeeded in escaping the fire, and pushed on to the pit-eye. In this effort many were successful, but ten others, some without a burn upon them, and others with faces scorched beyond recognition, were met by the after damp, which struck them down one by one. Information of the explosion was soon conveyed above ground, and whilst the struggle for life was taking place below, Mr. Makinson, the manager, and Mr. Close, the fireman, were descending the shaft and making the necessary preparations for examining the workings. About one-half of the men were met as the searching party proceeded, some few unscathed, but others frightfully disfigured. Not one of the dead men was found in his working place. All were making their way out when struck down, and two—a father and son—had evidently mistaken the road. The spot where the gas ignited would be about three hundred yards from the pit-shaft, and the farthest bodies would be about four hundred yards away. The gas is said to have ignited at the open light of the under-fireman, who was not injured. The damp appears to have come from a goaf, and to have entered the drawing road, where it exploded by a hole in the roof.

LONDON COMMISSION OF SEWERS.—At the last general meeting of the city Commission of Sewers, a communication from Captain Brown, registrar-general of shipping and seamen, was presented by Deputy Harrison, and read to the Court, respecting a new mode of street pavement for the city of London. After stating that the present system of pavement is defective from inequalities of surface, and the constant churning up of the foundation between the loose stones, the writer proposes to construct a pavement by a combination of iron and wood laid in alternate bars, transversely or obliquely, upon sleepers of wood or of stone, placed longtitudinally on the foundation; the interstices to be filled with rough, porous materials. The results of such an arrangement, he states, would be—first, a firm, uniform foundation; secondly, durable materials, smoothly and securely placed, and capable of being readily cleansed. Deputy Elliott said, having regard to the evils and inconveniences of the present system of street paving, any scheme calculated to lessen or remedy them, unless it were absurd on the face of it, was entitled to the respectful consideration of the court. On motion of Mr. Deputy Harrison, the proposal of Captain Brown was referred to Mr. Hayward, the engineer to the commission, for consideration, and to report on its feasibility. Touching the question of a supply of gas to the city under the operation of the new Act, which continues to engage public attention, Dr. Abraham gave notice of his intention to move, at their next meeting, a resolution to the effect that the commission do not enter into any further contract with the Great Central Gas Company for the public lighting, until the notice issued by that company to raise the price of gas to 4s. 6d. per thousand cubic feet shall have been unconditionally withdrawn.

OIL FROM ASPHALTUM.—The London *Engineer* says that a prospectus has been issued inviting subscriptions for an increase of the capital of the Asphaltum Company to £200,000, or double its original amount. The business of the company, which is respectably constituted, is to work certain mines of asphaltum near Havana, for the distillation of oil, which commands a ready sale in England at apparently a very remunerative price. The outlay for the property in Havana has been £68,000, of which only £18,000 was in cash, the payment for the remainder being in shares, which are not to rank for dividend until ordinary holders have received 5 per cent. The purchase included a concession from the Spanish Government of the exclusive privilege of making oil from asphaltum in Cuba and Porto Rico for fifteen years, and as the annual consumption of oil in Cuba is estimated at £250,000, this is considered valuable. The directors engineer, and manager of the company are to be remunerated by a percentage on the profits.

PATENTS.

UNITED STATES.

2,561.—Lester C. Beardsley, of Cleveland, Ohio, for an Improvement in Ventilators for Railroad Cars:

I claim the reservoir, I, perforated plate. J, tubes, L and H, and reversible funnel, K, when combined, constructed and operated as described.

2,580.—P. M. Hannas, of Easton, Pa., for Improved Water Wheel:

I claim, first, The gate box made of the two pieces, F and G, the former being detachable from the latter, and both being constructed and arranged as and for the purpose specified.

Second, The rings, E and E', applied to the wheels as set forth in combination with the annular plate, h, and the devices described or their equivalents, whereby the said rings may be moved from and toward each other by the turning of the said plates as described for the purpose specified.

Third, I claim the rings, E and E', and the annular plate, h, in combination with the gate, H, and the lever, K, or its equivalent, the whole being arranged and operating substantially as described, so that the movement of the rings may depend upon that of the gate.

Fourth, The wheel composed of the buckets, M, with their inclined outer ends, and the re-acting bucket, N, between the inclined flanges, q and r, the whole being secured to the shaft, L, in combination with the stationary block, P, its concave sides and curved vanes, Q, the whole being arranged as and for the purpose described.

2,581.—Thomas Harbottle and M. F. Fowler, of New York City, for Improved Apparatus for Directing Water to, and Maintaining Continuous Pressure upon, Hydraulic Rams:

We claim interposing between the pump and each of the rams of the series, the described apparatus to effect the maintenance of the pressure upon either of the said rams, while the pump is acting upon others of the series of rams, in the manner and for the purposes set forth.

2,584.—John H. Irwin, of Beardstown, Ill., for Improvement in Lamps:

I claim forming a bearing, 4, for the rod, F, of the wick wheels, 6 6, by turning or bending the part, 3, of the wick tube between the slots, 2 2, as and for the purpose specified.

2,588.—George McIlwain, of Philadelphia, Pa., for Improvement in Cases for Water and Gas Cocks:

I claim, the cap, B, provided with the opening, e, and lid, C, as described, when the said cap is applied and adjusted over the upper end of the tube, A, so as to rest, independently of the said tube, directly upon the gravel or sand which may be used to support the latter and the usual pavement, in the manner described and set forth and for the purposes specified.

2,596.—Jacob Pleiffer, of Niagara Falls, N. Y., for Improvement in Railroad Signal Lights:

I claim the described mode of attaching and working signal lights for railroad switches, by means of the combination of the two levers, h and r, upright staff or fork, s s, and frame for colored glass, l, working substantially as set forth, and for the purpose specified.

2,610.—John A. Thompson, of Cayuga, N. Y., for Improvement in Railroad Car Ventilators:

I claim the combination of the box, B, grooved as described, with the three-sided deflector, A, the same being applied and operated in the manner set forth.

2,619.—J. S. Heartt and Samuel English, of Troy, N. Y., assignors to J. S. Heartt, James Ostrander, of Troy, N. Y., and Joseph Ridgeway, of South Amboy, N. J., for Improvement in Machines for Making Fire-clay Gas Retorts:

We claim, first, The removable plate, e, when secured to and released from the end of the hollow core, B, having a communication with a supply of atmospheric air or other fluid, as and for the purpose set forth.

Second. The sliding core shell, k, when applied so that the core can be thereby made to terminate either within or beyond the end of the outside die, A, as described.

Third, The combination of the condensing air pump, P, or any equivalent therefor, with the outer die, A, mold, M, and support, F, core, B. extended opposite to the recess, n, in the mold, and a device for forcing the plastic material between the said core and die into the mold, substantially as and for the purpose set forth.

PORTABLE GAS-WORKS.

STRATTON & BROTHER'S PATENT GAS-WORKS, for making Gas from ROSIN or COAL OILS. STRATTON'S Patent Double Retort, for Coal, Wood, or Rosin.

Our Patent Gas Works have been put up in some forty Country Residences, Factories, Churches, &c., in which an experience of *ten years* gives entire satisfaction.

Water Works also put up in country residences. All work warranted.

Reference—Prof. JAS. C. BOOTH, U.S. Mint, Phila.
CORNELIUS & BAKER, "
STRATTON & BROTHER,
719 Walnut street, Philadelphia.

BUTLER'S PATENT PORTABLE ROSIN GAS-WORKS,
FOR
Dwellings, Churches, Country Villages,
As well as for Consumers in Large Cities.
JOHN BUTLER,
No. 112 Fulton st. and 15 Henry st.,
Brooklyn, N. Y.

FOR LIGHTING RAILROAD CARS AND STEAMBOATS BY WITH GAS.
The whole process of Filling the Gas-Holders of a Railway Train, requires but Three Minutes.
Apply to the
NEW YORK CAR & STEAMBOAT GAS. CO.,
No. 117 Fulton st., N. Y.

C. R. WOODWORTH, Manufacturer of
PORTABLE GAS WORKS,
74 WALL STREET, NEW YORK CITY.

WANTED.

A PRACTICAL GAS ENGINEER, competent and successful; now running a Gas-Works, wishes a situation to manage a concern of considerable size, or a department in a large work. Is experienced in all parts of the business, and will give best references with satisfactory reasons for change.
Address T P. S., Rooms of AMERICAN GAS-LIGHT JOURNAL, 39 Nassau street, N. Y. City.

AN ACCOUNTANT, WHO thoroughly understands the working of Gas Work accounts, by double entry, is desirous of an engagement. Is willing to devote either the whole or a portion of his time, as may be required. Address E. P.

WANTED.—GOOD LATHE AND Chandelier Workmen wanted by
MITCHELL, VANCE & CO.,
At Works 339 West Twenty-fourth street,
Near Tenth avenue.

UNION WIRE-WORKS.

ROBERT McMURRAY & CO., No. 29 Fulton Street, New York, Manufacturers of Copper, Brass, and Iron Wire Cloth for Gas Works, all kinds of Foundry Riddles, Sieves, and Screens. Improved Wire Window Shades, Wire Bolting Cloth, Duster-Wire, Wire Cloth for fanning machines, Rosin, &c., Locomotive Wire, Fire Guards, Ornamental Wire Work of every description. Patent Improved Wove and Laid made Dandy Rolls repaired and designed to order.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.
Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.
Patent GATES, for Water and Steam-stops.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

DRAIN-PIPE.

DRAIN PIPES, ENGLISH AND AMERICAN.
Garnkirk Chimney Tops,
Plumbers' Materials,
Minton's Encaustic Tiles.
For Sale by
MILLER & COATES,
279 Pearl st., New York.

Croton Aqueduct Department.

CROTON AQUEDUCT DEPARTment, October 9, 1861.—Public notice is hereby given that a further penalty of ten per cent. will be added to all unpaid Water Rents, on the first day of November next.
R. C. HANCE, Register.

PHOTOMETER APPARATUS and Room for Sale.—The Room is about 6 feet wide by 12 feet long, painted black inside and screwed together. It can be taken down and boxed for transportation. All the pipes and fittings are complete for immediate use. Address PHOTOMETER, care of the AMERICAN GAS-LIGHT JOURNAL, 39 Nassau street, N. Y.

WATER-METERS.

H. R. WORTHINGTON'S PATENT Water-Meter.—This Meter combines accuracy, simplicity and remarkable durability, with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

STOP-COCKS, &C.,

DANIEL THOMPSON, Machinist and Manufacturer of Stop-Cocks, Fire-Plugs, &c., for Water-Works, Stop-Cocks, Valves, Drip Pumps, &c. for Gas-Works, No. 133 Elfreth Alley, Philadelphia.

IRON RETORTS.

CELLULAR GAS-RETORTS.—C. M. CRESSON'S CELLULAR Gas Retorts, Patented October 3d, 1854. Adapted to the manufacture of GAS from Rosin, Coal, Wood, &c., and now in use at the Philadelphia Gas Works. Patent Rights for sale. For information apply to HENRY S. HAGERT, Attorney for Patentee, S. E. cor. of Walnut and Sixth sts., Philadelphia, Pa.

HARRIS LOUDERBACK, FIRE-BRICK LAYER
AND GAS RETORT SETTER,
No. 1005 Clement Street, Philadelphia.

PROPOSALS.

TREASURY DEPARTMENT,

OFFICE LIGHTHOUSE BOARD, Dec. 6, 1861.

Sealed Proposals will be received at this office until one o'clock P. M. on Monday, the 6th day of January, 1862, for supplying the Lighthouse establishment with seventy thousand gallons of the best quality pure winter strained sperm oil, to be divided into three lots, and to be delivered at the times undermentioned, alongside of the government supply vessels, or at the warehouse or other places of deposit, to be designated by the inspecting officer or other authorized agent of the Lighthouse Board, in strong, tight, well made casks, suitable for shipping, in good order, of an average capacity, each, of from eighty to one hundred gallons.

Either lot or all of them may be delivered at New York, New London, Sag Harbor, Boston, New Bedford, Edgartown or Nantucket, at the option of the bidders. The place of delivery must be distinctly stated in the bids, and will be embraced in the contracts.

The three lots will be delivered as follows, viz:

Lot No. 1.—(28,000) Twenty-three thousand gallons on the 1st day of April, 1862, or as soon thereafter as the proper tests and gauging can be completed.

Lot No. 2.—(32,000) Thirty-two thousand gallons on the 1st day of June, 1862, or as soon thereafter as the proper tests and gauging can be completed.

Lot No. 3.—(15,000) Fifteen thousand gallons on the 1st day of October, 1862, or as soon thereafter as the proper tests and gauging can be completed.

No part of the oil proposed for and to be embraced in the contracts under this advertisement will be accepted, received, or paid for, until it shall have been proved to the entire satisfaction of the person or persons charged with its examination, test and inspection, to be the best quality pure winter strained or bagged sperm oil, free from mixture with other or inferior oils and adulterations, and that it will remain in a sufficiently fluid state for free burning in lamps at a temperature of 32 degrees or lower of Fahrenheit's standard thermometer.

The usual means for determining the character and quality of the oil will be employed, viz.: for specific gravity, by burning to determine the length of time the oil will burn in untrimmed capillary or jacket lamps, the amount of residuum in each lamp after it burns out, and, if necessary, any other proper tests to arrive at correct conclusions that may be deemed necessary.

The casks must be gauged, under the direction and personal supervision of the inspecting officer, by a custom-house or other legally authorized and sworn gauger, according to the United States standard, and must be marked and accepted before they are removed from the cellar or warehouse of the contractor.

Proposals will be received and considered for each lot separately, or for all of them, at the option of the bidder; but no bid will be considered for a less quantity than that specified as one lot, to be delivered at one time and place. Each bid must state explicitly the rate per gallon, in writing, the number of lot or lots bid for, and the time and place of delivery, conforming to this advertisement.

Bids submitted by different members of the same firm or copartnership will not be considered.

The Lighthouse Board, under the authority of the Department, reserve the right to reject any bid, although it may be the lowest, for other considerations than the price.

No bid will be considered for any other kind or description of oil than that specifically called for in this advertisement.

A bond, with security to the satisfaction of the Department, in a penalty equal to one-fifth of the amount of each contract made under these proposals, will be required of each contractor, conditioned for the faithful performance of the contract, to be executed within ten days after the acceptance of the bid.

Every offer must be accompanied by a written guarantee, signed by one or more responsible persons, and known to the Department as such, or certified by a United States District Judge, Attorney, Navy Agent, or Collector of the Customs, to the effect that, if the bid or bids be accepted, the bidder or bidders will duly execute a contract in good faith, according to the provisions and terms of this advertisement, within ten days after acceptance; and that in case the said party or parties offering shall fail to enter into the contract as aforesaid, he or they guarantee to make good the difference between the offer of the said party or parties and the next lowest bidder. All bids must be sealed and endorsed "Proposals for oil for lighthouses," and then placed in another envelope, and directed, prepaid, to the Secretary of the Lighthouse Board, Washington city.

All bids will be opened publicly, at the hour and on the day specified.

Payments will be made for the several lots of oil within thirty days after they have been received by the United States.

By order of the Lighthouse Board,
THORNTON A. JENKINS, Secretary.

FORM OF OFFER.

I (or we), ——, of ——, State of ——, hereby offer and agree to furnish and deliver at ——, agreeably to the provisions, and in conformity to the terms, of the advertisement of the ——, from the office of the Lighthouse Board. Should —— offer or bid be accepted, —— request to be informed at ——, and that the contract may be forwarded to —— for signature and certificate.

—— —— (Signature.)
(Place.) ——.
(Date.) ——.

FORM OF GUARANTEE.

We, the undersigned, residents of ——, in the State of ——, hereby jointly and severally covenant with the United States, and guarantee that in case the foregoing —— ——, of ——, be accepted, —— will, within ten days after the acceptance of said ——, execute a contract for the same, with good and sufficient sureties, to deliver the —— of oil proposed, in conformity to the terms of the advertisement hereto appended, under which it was made. And in case the said

PROPOSALS.

—— shall fail to enter into a contract as aforesaid, we guarantee to make good the difference between the offer of the said —— and the next lowest bidder.

Witness: ——.
—— ——. } Sureties.
—— ——. }
(Place.) ——.
(Date.) ——.

I hereby certify, that to the best of my knowledge and belief, the above named guarantors are good and sufficient.

—— ——. (Signature.)
(Place.) ——.
(Date.) ——.

THE PEOPLE'S GAS-LIGHT & COKE COMPANY, OF CHICAGO ILLS.

FOR SALE—Twenty of the first mortgage 10 per cent. bonds, for One Thousand Dollars each, payable on the first day of April, 1866, with semi-annual Coupons attached, for Fifty Dollars each, payable at the Bank of the Republic, in New York, on the first day of April and October, in each year. H. A. Tucker, President of the Exchange Bank, of Chicago, is the Trustee.

SECURITY.

The security for these bonds is the first Mortgage made by the Company, on all their Real Estate, Works, Mains, Franchises, and whatever may be appendant or appurtenant to their property or rights as a corporation, to wit:

On their Real Estate and Works, consisting of an eligible lot of land, 404 feet by 244 feet, containing 98,576 superficial feet, fronting upon Rucker street, and extending thence to Throop's Canal, having a water front of 404 feet, with a depth of water of 14 feet. A most eligible site for the delivery of Coal.

Upon this site, is a Retort-house of brick, 76 feet long by 52 feet wide, with iron frame and slate roof.

A Purifying-house, also of brick, 40 feet long by 40 feet wide, also with slate roof. An Office and Meter-room, also of brick.

Also a Tank, capable of floating a Gas-holder containing 200,000 cubic feet of Gas.

The cash cost of this land and these improvements was $60,000, which has been paid, and the whole is without lien or other incumbrance.

During this season the Company have erected works, to be completed next month, of a first-class character, with about twelve miles of street mains, and already are putting in a large number of service pipes. Cost of the holder, apparatus, and fixtures is $112,500 in addition to the cost of land and buildings, making a total cost of $172,500.

BUSINESS PROSPECTS OF THE PEOPLE'S GAS COMPANY.

So rapidly has Chicago, the Empire City of the great West, increased in population, that from 28,269 in 1850, she has now marched on to 115,000 in 1860, and at this rate will possess in 1870 a population of at least 300,000. The old Gas Company never dreamed of a growth like this, and consequently never prepared for it. Their works and mains are all too small for the rapidly increasing demand. Whole wards in the city, numbering tens of thousands of inhabitants, are without a single foot of gas main. The necessity for further means of supply was apparent to the legislature in 1855, and on the 12th of February, of that year, they passed a law to incorporate "The People's Gas Light and Coke Company." A number of the leading men in Chicago organized the Company under this charter, and on the 30th of August, 1858, the Common Council of the city gave their assent to its provisions, and the usual authority to the Company to open the streets.

For further particulars, address the TRENTON LOCOMOTIVE AND MACHINE MANUFACTURING COMPANY, Trenton, N. J.

OFFICE OF THE WATER COMMISSIONERS,
Jersey City, Nov. 11th, 1861.

SEALED PROPOSAL WILL BE received by the Water Commissioners of Jersey City, until Monday, December 16, at 12 o'clock M., for furnishing and laying about 1,000 feet of cast iron water pipe—equal in capacity to a 36-inch main, across the Hackensack river and on the bottom of the same.

Bidders to furnish plans for the construction and laying of pipes, and the plan adopted to be paid for at such price as the Board may direct. The work to be done during the summer of 1862.

The right is reserved to reject any or all plans and proposals if deemed for the interest of the city.

All necessary information in regard to the work may be obtained on application at this office.

R. C. BACOT, Supt. and Engr.

Niagara Falls Water Power.

CAPITALISTS AND MANUFACTURERS.—This immense water-power is now ready for immediate occupation, together with one hundred acres of land, embracing one-quarter of the village, on which to locate mills and manufactories.

The stipulations for price of power will be one-half that at Lowell, Mass., and the quantity is almost unlimited.

Should the demand warrant it, the American Fall can easily be be stopped and its great volume discharged through the bank below its present site, for mill purposes, under a head and fall of 200 feet.

The title is perfect and the estate unincumbered. For further information apply to N. W. Day or A. P. Floyd, Niagara Falls; Alexander Hay, No. 1208 Vine st., Philadelphia; Hon. T. A. Jenckes, Providence, R. I.; D. Thaxter, Boston, or the owner,

HORACE H. DAY, No. 91 Liberty st., N. Y.

GAS AND WATER-PIPE.

W. & J. GRIFFITHS & CO.—City Tube Works, Malleable Iron and Brass Foundry, No. 27 North Seventh street, Philadelphia. Manufacturers of Wrought Iron Pipe, Lap-Welded Flues and Fittings; also, Brass Work of all descriptions, for Gas, Steam and Water. Particular attention given to Heating Buildings, &c.

PARIS'S PATENT
Glass-Enamelled Wrought Iron Tubes,
PROSSER'S PATENT
LAP-WELDED IRON BOILER TUBES.
TUBES FOR ARTESIAN WELLS, CONVEYING STEAM OR WATER, SHAFTING, &c., SCREWED OR COUPLED TOGETHER, in various ways.
THOS. PROSSER & SON, 28 Platt st., N.Y.

CAST AND WROUGHT IRON Pipe, Branches, Elbows, Sleeves, &c. Lamp-Posts, Wrought-Iron Lanterns for Lamp-Posts, Gas Retorts (clay or iron), Street Mains in 9 or 12 feet lengths. Sheet-Iron cut to pattern for Gas-holders. For sale by the Manufacturers' Agent,
HENRY G. NICHOLS, 24 Pine st., N. Y.

HUNTER, KELLER & CO., Manufacturers of *WROUGHT-IRON PIPES & FIXTURES*, of all descriptions, for
STEAM, WATER AND GAS.
144 Centre street, New York.

GIRARD TUBE WORKS—MURPHY & ALLISON, Proprietors. Wrought Iron Coke-Welded Tubes, for Gas, Water, Steam, &c. Wrought, Cast and Malleable Iron Fittings, Steam and Gas Cocks, Valves. Also, Galvanized Tubes and Fittings.
Office 1908 Market street, Philadelphia.

AMERICAN TUBE WORKS.—W. G. Smith & Co., Forty-sixth street, East of 10th Avenue, New York City. Manufacturers of WELDED IRON PIPE for Steam or Gas, of all sizes, from 1-8th to 3 inches.

PATENT PREPARED WOOD-PIPE for Gas Mains.—Wm. Stephenson would call the attention of Gas Companies and Engineers to his Patent Prepared Wood Gas-Pipe. This Pipe is prepared in a way so as to effectually prevent its decay, and has been proven to be superior to Iron pipe in three towns where he has erected Gas-Works.

The cost of the Pipe, and the facility with which it can be laid, and *also its not being subject to expansion* and contraction by change of temperature, render it *entirely free from leakage;* there is also less condensation than in Iron pipe. These are among the advantages gained by the use of this Pipe, and are sufficient to recommend it to the favorable consideration of Gas Companies and Engineers; and it is considered, by those who have examined it, as a most valuable improvement.

A sample of this pipe may be seen at the rooms of the AMERICAN GAS-LIGHT JOURNAL, No. 39 Nassau street, New York; and further information, with reference to this Pipe, may be obtained by application to the Patentee,

WM. STEPHENSON, Gas Engineer,
Fremont, Ohio.

PATENT BITUMENIZED PIPES for Water, Gas, and Drainage.—Reduction in price on account of the exemption from duty on paper. These pipes possess all the properties necessary for the conveyance of Gas, Water, and also for Drainage purposes, viz., great strength, great durability, and perfect inoxidability; and being non-conductors are not affected by frost, like metal pipes; they are proved to resist a pressure of 220 lbs. on the square inch (equal to 500-ft. head of water), and can be made up to any greater strength if required. They are only one-fourth the weight, and when laid down are fifty per cent. cheaper than iron pipes; they are made in 7 ft. lengths, and the joinings are simple and inexpensive.

These Pipes have been in use nearly three years, and have given the most perfect satisfaction.

Further particulars as to joining, &c., and specimen pipes, may be obtained at the office of the Company, on application to
Mr. ALEXANDER YOUNG,
14 Cannon street, E. C.,
London, England.

☞ An agent will soon be appointed for New York.

HEATING APPARATUS.

JOSEPH NASON & CO., Constructors of Apparatus for Warming Public and Private Buildings by Steam and Hot Water.

Improved Fans for Ventilating Hospitals and other Public Buildings.

JOSEPH NASON,
HENRY R. WORTHINGTON,
No. 61 Beekman street, corner of Gold street, New York.

McKINNY & KELLY,
MANUFACTURERS OF
COAL-SCOOPS AND COKE-BARROWS,

FURMAN ST., near Fulton Ferry, Brooklyn, N.Y.

GAS-BURNERS.

T. G. ARNOLD, Manufacturer of Gas Burners, Mercury Cups, Portable Sockets, Burner Pillars, &c., No. 447 Broome street (second door west of Broadway), New York. Imported Scotch Tips and Burner Pivers always on hand.

ORNE'S PATENT FILTER-REGULATING GAS-BURNER, admitted by all practical and scientific men, who have examined its movements, to be
THE BEST GAS-BURNER YET INVENTED.
They are self-regulating, gas-purifying, indestructible, and most economical.
For sale by S. A. STETSON & CO.,
350 Washington st., Boston.

PERFECTION.—This recent Improvement in Gas-Burners embraces the great economy of the Hicks Patent Burner, a gain of over 75 per cent. in light. This Burner is now offered to the Trade and all consumers of gas, at the price of the common burner. It is anti-corrosive, gives a uniform and beautifully-shaped blaze, under any pressure, and will not get out of order.

It has been adopted by the Manhattan and Brooklyn, N. Y., Gas-Light Cos., for street lamps.

Samples will be sent to each Gas Co. in the United States, if requested.

Address, L. E. HICKS, 335 Broadway, New York.

WOODEN PURIFYING TRAYS.

WOODEN TRAYS FOR GAS-PURIFIERS.—The subscriber manufactures the WOODEN TRAYS for GAS-PURIFIERS on the invention of Wm. Combe, *cut from solid wood*, which are found superior to the iron plates formerly used, as being cheaper and more durable. The public are cautioned against the statements of R. G. Hunt, published in the AMERICAN GAS-LIGHT JOURNAL, Nov. 1st, 1861, page 137, as wholly without foundation. The following letter is from the Commissioner of Patents:

U. S. PATENT OFFICE, Nov. 9th, 1861.

Sir,—I have to inform you that *no patent has been ordered to issue* to Mr. R. G. Hunt on his application [for solid wood trays or gas sieves] with which an interference was declared with the application of Mr. Hawxhurst, assignee of Wm. Combe. Respectfully,

D. P. HOLLOWAY,
Com. of Patents.

All orders for Solid Wood Trays executed at the shortest notice on reasonable terms by
JOHN L. CHEESMAN.
No. 147 Avenue C, near Tenth st., New York City.

CONICALLY SLOTTED SOLID Wood Trays for Gas-Purifiers.—Admitted to be the best, cheapest, and most durable seives for gas-purifiers ever used.

Secured by Letters Patent of the United States, both for the machinery used in the manufacture, and for the seive itself.

For sale on reasonable terms to Gas-Light Companies or Agents, on application, by letter, to the patentee,

RICHARD G. HUNT,
631 Fourth st., near Avenue C,
New York City.

N. B.—All persons are warned against purchasing these seives of others who falsely pretend to have patents for them. Suits will be commenced immediately against all persons infringing my patents by using or making wooden sieves, but those who hereafter purchase from me can buy their seives cheap and will not be troubled by me on account of former purchases. R. G. H.

GAS-ENGINEERS.

SCAMMON'S GAS-APPARATUS for Private Residences, Factories, Hotels and Cities. See engravings of Rosin and Coal Gas-Works in AMERICAN GAS-LIGHT JOURNAL for Dec. 1, 1860, pages 179 and 180.
STEPHEN SCAMMON,
GAS-ENGINEER AND CONTRACTOR,
561 Broadway, New York.

GAS-WORKS ERECTED FOR Cities and Villages. Plans and Specifications furnished for works of any desired capacity, drawings of Retort Settings for Benches of one, two, three or five Retorts.
GAS APPARATUS
of every description.
F. A. SABBATON,
Gas-Engineer and Contractor, Albany, N. Y.

DIMMOCK, DWIGHT & CO. Engineers and Contractors for the erection of Coal Gas-Works. Offices 135 and 137 William street, New York City; and No. 2 Elm street, Springfield, Mass.

References by permission:
GEORGE D. MORGAN, Esq., New York.
AARON CLAFLIN, Esq., "
A. B. WOOD, "
GEORGE BLISS, Esq., N.Y., Pres. M.S & N.I.R.R.Co.
GEO. M. ATWATER, Esq., Springfield, Mass.
JAS. D. BREWER Esq, Pres. Springfield Gas Co.
JOHN I BAKER, Esq, Pres. Beverly Gas Co.
HENRY E. RUSSELL, Esq., Pres. N. Britain Gas Co.
J. DUNHAM, Esq, Pres. Norwich, Ct. Gas Co.
W. C. STREET, Esq., Sec. Norwalk, Ct. Gas Co.

THE AUBIN GAS-WORKS CO., OF ALBANY, N. Y., refer to the following Gas-Light Companies using their Works, to prove that Gas stocks can pay handsomely, and yet a rich and *cheap* Gas be made, viz.: Plattsburgh, Whitehall, Palmyra, Waterford, Bath, Amsterdam, Fort Plain, N. Y.; Rutland, Vt.; Flemington, N. J.; Smyrna and Dover, Del.; Jersey Shore and Pittston, Penn.; Greensboro and Salem, N. C.; Sorel, St. Hyacinthe, and Point Levi, Canada. Agents wanted to extend the sale of the Aubin Portable Gas-Works, unsurpassed for simplicity, safety and economy.

MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS.

MANUFACTORIES

SUFFOLK ST. CLERKENWELL GREEN. & ALLEN ST. GOSWELL ST. LONDON.

BOSTON, MASS., 1 BARRETT STREET,—August 2, 1860.

RICHARD GLOVER begs to inform GAS COMPANIES and CONTRACTORS that he has always on hand a large assortment of THOMAS GLOVER'S (of London) celebrated DRY GAS METERS.

THOMAS GLOVER'S Meters have now been in use in the United States and British Provinces, for the last FOURTEEN YEARS, and are extensively used by many Gas Companies, to their entire satisfaction; and R. GLOVER can with all confidence refer to them in proof that THOMAS GLOVER'S Meters are— the most PERFECT in PRINCIPLES— the most CORRECT in REGISTRATION—and more DURABLE than any other Dry Gas Meter made in the United States or Great Britain. R. GLOVER will at all times be glad to repair any Gas Meters sent him at the above factory. If any of them are of THOMAS GLOVER'S manufacture, and of a more recent date than THREE years, he will make no charge.

DOWN & MERRIFIELD,

Nos. 340, 342, 344 and 346 West Twenty-second Street, North River, NEW YORK CITY,

MANUFACTURERS OF

WET AND DRY PATENT GAS-METERS,

Pressure-Registers, Pressure-Indicators and Gauges, Station, Show, Customer, and Experimental Gas-Meters, Centre or Hydraulic Valves, Governors, Compensators for Exhausters, and the Standard, Testing Gas-Holders* for Proving Meters, now used in the State of New York in compliance with an Act of the Legislature.

ALSO, BUNSEN'S PHOTOMETER, WITH COMPLETE APPARATUS FO WORKING THE SAME

* The standard of measurement of this Gas-Holder is given by Professors TORREY, of the U. S. Assay Office; JOY, of Columbia College; GIBBS, of the Free Academy, and several other distinguished scientific gentlemen.

CODE, HOPPER & GRATZ,

1500, 1502 and 1504 FILBERT ST., PHILADELPHIA.

MANUFACTURERS OF

Pressure Registers, Pressure Indicators, Pressure Gauges, Photometers, Governors, Station Meters, Customer Meters, (Wet and Dry,) Experimental Meters, (Wet and Dry,) Show Meters, (Wet and Dry,) Meter Provers, Centre Seals, &c.

The high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas-Meters than all other manufacturers in this country combined, must present itself as a security to parties desirous of securing the most reliable instruments. Having completed a most extensive addition to our Factory, and added many important improvements to our machinery, we are enabled to fill orders entrusted to us with despatch, and in all cases *guarantee entire satisfaction.* Our Patent Rotary-Valve Dry Gas-Meter is now used by upwards of Two Hundred Gas Companies, giving general satisfaction; we therefore recommend it, believing it superior to any other Dry Gas-Meter manufactured. All Meters tested separately by a sworn Meter-Inspector, and sealed when desired.

JOHN J. GRIFFIN & CO.,

76 WEST THIRTY-SEVENTH ST.,

NEW YORK CITY,

MANUFACTURERS OF WET AND DRY GAS-METERS,

Station-Meters, Proving-Machines, Show-Meters, Test-Meters, Pressure Indicators, &c.

All of our Work is Guaranteed to be of the First Quality, as well as the material, and for this we can refer to numerous Gas-Light Companies.

JOSEPH LENNIG & CO.,

Nos. 313 & 315 NEW MARKET St., above Vine St., Philadelphia, Pa.,

MANUFACTURERS OF

Wet and Dry Patent Gas-Meters, Station, Show, Customer, and Experimental Meters, Photometers; Pressure-Registers, Indicators, and Gauges; Governors, Meter-Provers, Centre-Seals, Fluid Gauges, &c.

The flattering Testimonials we are receiving from Gas Officers, accompanied with expressions of such general satisfaction, and the fact of a tried experience for fourteen years, must present itself as a security to parties desirous of securing the most reliable Instruments. We therefore recommend our Patent Dry Gas-Meter, believing it superior to any Meter manufactured. Messrs. J. LENNIG & Co. confine their sole attention to the business of GAS-METER making.

Our materials are the best in use; the strictest attention is given to workmanship, and we guarantee entire satisfaction to all purchasers.

Purchasers may at any time inspect our Works, and the materials of which our Meters are manufactured. We are fully prepared to execute all orders, upon the shortest notice, and it will be to the interest of parties to call upon us.

☞ **Each Meter Tested Separately by a Sworn Inspector, and Sealed when desired.** ☜

METERS REPAIRED AND FORWARDED WITH DISPATCH.

POTTS' REVOLVING SIGNAL LIGHTS,

PATENTED SEPTEMBER 8, 1857.

Mr. ALBERT POTTS, the well known Inventor of the LAMP-POST LETTER BOXES, which have been adopted by the Post Office Department for the large cities of the United States—and also of the GAS METER BOX, to be set in the front walls of houses, thus doing away with visits from Gas Inspectors, or burglars in gas-clothing, has lately brought forward a third Invention, which in point of importance and world-wide usefulness, surpasses the others entirely.

These SIGNAL LIGHTS are intended for use on Vessels propelled by Steam, and those exclusively. They specially indicate the presence of a Steamer, and by their use, there will be less likelihood of mistakes, and consequent collision than at present. They are also intended for SIGNALLING AT NIGHT, and can be used for that purpose UNDER ANY CODE of SIGNALS NOW ARRANGED FOR FLAGS.

This Improvement in Lights for Steam Vessels, consists in having the Lanterns containing the colored lights, connected by means of a series of cogged gearing with some convenient part of the Engine or Machinery, so as to cause them to have a revolving motion around their axis. On side wheel steamers, the Lanterns should be placed directly over the wheel-houses, and the power, or motion to turn them, may then be very conveniently obtained from the paddle wheel shaft On Propellers, the Lanterns should be placed on each side of the Pilot House, or hurricane deck, and the rotary motion derived from any convenient or suitable part of the Engine or Propeller Shaft. Each Lantern is supported on the end of movable cranes, so that their relative positions may be changed and properly adjusted to suit the view of observers on either side of the vessel at the time of signalling.

The Lanterns to be used in this improvement may be constructed for Burning Oils, Fluids, Gas, or any of the known modes of illumination, and should be furnished with one or more lenses and reflectors, so as to concentrate the rays of light, and project them over the horizon with the greatest intensity. The lenses for this purpose should be made with colored glass, viz., Red and Green, and the position of the respective Lanterns, according to the color of the lenses therein, must be placed on the sides of the vessel so as to answer to the requirements of Rules and Regulations made and published by the Supervising Inspectors of Steamboats, agreeably to the Act of Congress of the United States in such cases made and provided. That is to say—by said Regulation—the Lantern having the green lenses for producing the Green Colored Light, must be placed on the starboard side of the vessel, and the other Lantern producing the Red Light, to be placed on the port side thereof In pursuance, also, of the aforesaid Rules and Regulations, there is to be found in board and behind each Lantern, a screen to answer the purposes therein mentioned.

The cogged gearing, by which the Lanterns are connected with the Engine or paddle wheel shaft, and thereby caused to revolve when the Engine is in motion, is so arranged that the connection may be readily shipped or unshipped, and the lanterns made stationary or otherwise, at the pleasure of the Pilot, or those whose duty it may be to operate and attend to the same. The cranes on which the Lanterns are placed, are also rigged so as to be readily turned horizontally from one position to another, so as to present one or both lights to the view of observers when laying athwart ships at the time of signalling.

On the Use and Application of the Improvement for Night Signals.

When the vessel is under weigh or going ahead in its course, the Lanterns are to be placed directly athwart ships, so that such colored light therein will then have the position and place prescribed by Rule Seventh of the aforesaid Supervising Inspectors of Steam Boats, and with the screens behind them, as above described, will then answer all the intents and purposes for which the colored lights are thus required to be used, as illustrated in the several diagrams published by said Inspectors for the working of a system of Colored Lights. The Lights in this case, according to the color seen by the observer, indicate the course or direction of the vessel whereon they are carried When the Lanterns with the colored lights therein, are made to revolve around on their axis, as proposed in this improvement, in addition to the signal above, another and as we believe, very important and useful signal is thus formed, indicating that the vessel, whereon it is carried is a Steamer. In dark foggy nights, it is found by experience, to be somewhat of a difficult task to distinguish sailing vessels from Steamers and Propellers, especially when the latter are rigged, and carry a press of sail. When Steamers meet "head and head," it is the duty of each to pass to the right, or, on the larboard side of the other. Whereas, when a Steamer meets a sailing vessel, the former must give way and allow the latter to pursue its course. Hence, to carry out the regulations of the said Steamboat Inspectors, and prevent collisions, it is important to have some infallible sign, whereby the character of the vessel may be readily seen and determined. Several very fatal collisions have recently taken place through mistakes of this kind.

On Signals for Speed and Distance.

The gearing of the Lanterns with the paddle wheel or propeller shaft, may be so arranged as to be an index of their speed. A very good proportion, would probably be to make the Laterns turn about one third as fast as said shaft. Hence, when the speed of the vessel is previously known, when making a certain number of revolutions of the paddle or propeller, it becomes an easy task from observing the time with which the Lanterns thereon may be turning to approximate to the speed with which the said vessel is moving at the time of observation. Again, as the arcs described by the rays of light from each lantern, as they revolve around on their axis, is greater in proportion to the distance from said lantern, so will the time in which said rays move over any given space, be less in the same proportion. Hence, when the lights are very remote, or far off, from the observer, the duration of each column or cylinder, of rays from each lense, would pass the eye of the observer, in a short space of time, or with great velocity. Whereas, at a nearer point of observation, the time of its passage would be considerably lengthened, or the motion thereof apparently much slower. From these facts, we believe the improvement is susceptible of indicating, in an approximate manner, the speed and distance of vessels whereon the revolving lights may be used.

On the Application of the Improvement for Marine Telegraphic Purposes.

The Revolving Lights can be readily applied to the general purposes of Marine Signalling at night, as follows: In order to show this application, we have adopted the Numbers as given in Roger's Code of Marine Day Signals, believing that work to be somewhat of a standard in matters of this kind. Instead of the flags used in the above code, for day signals, to indicate the combinations of two or more letters of the Alphabet, which combination is referable to certain numbers indicative of the words or sentences telegraphed, we propose to perform the same operation, at night, by means of the two revolving colored lights, so as to indicate the numbers directly to which the intended words or sentences to be telegraphed are referable. Thus, whether the vessel to be signalled is ahead, astern, or abaft the beam, the position of the two colored lights must be so adjusted, by means of the moveable cranes, whereon said lanterns or lights are fixed, that the two lights may be fully made visible to the observer. When both lights are thrown into this position, stopping the motion of the lanterns may be the signal for calling attention, or a rocket fired off, or the steam whistle blown, would answer the same purpose. Now, in order to represent the ten numerals, we propose to indicate them by the respective motions of the two colored lights, as follows:

RED LIGHT.				GREEN LIGHT.			
One Red,	Represents	Number	1.	Two Green,	Represents	Number	2.
Three	do.	do.	3.	Four	do.	do.	4.
Five	do.	do.	5.	Six	do.	do.	6.
Seven	do.	do.	7.	Eight	do.	do.	8.
Nine	do.	do.	9.	One	do.	do.	0.

In the above arrangement, it will be seen that all the odd numbers are made by the Red Light, and the even numbers by the Green Light. In order to indicate the repeat of the last number, once or more times, or for other special purposes, which may hereafter be found useful and necessary, an even number of lights may be shown by the Red, and an odd number by the Green. It will be understood that when the Lanterns are made with three lenses in them, the numerals as above arranged are formed by the number of times a new light or lense is presented to the observer. Thus to indicate the number 3, the Red Light or Lantern would make one entire revolution; and to make the number 6, the Lantern carrying the Green Light would make two revolutions, and so on with the other numbers. When a symbol is made, the motion of the Lantern is to be suspended for a short time, and when a number expressing a sentence is formed, the lantern may be stopped for a longer period, or some one of the special signals above referred to, may be used for this purpose.

To show the application of this improvement as above mentioned, whereby these Lights can be used as readily for Night Signals, as Flags are used for Day Signals by the author of Roger's Code, we shall use the sign O colored red or green, according to the light used, to show the number of movements performed by the respective lights in order to represent any desired number of said code, suitable for the required purpose.

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O,	
O, O, O, O, O, O, O.	
O, O.	
O. O.	

The above would represent the number 5722, and by reference to said Roger's Code, would be found to stand before the sentence:
"WILL YOU SHOW THE NUMBER THAT REPRESENTS YOUR NAME?"

RED LIGHT.	GREEN LIGHT.
O.	
O, O, O, O, O.	
O, O, O, O, O, O, O.	
	O, O.

Here the number expressed is 1572, and per the same Code, stands for
"WHERE ARE YOU BOUND?"

RED LIGHT.	GREEN LIGHT.
O.	
O, O, O, O, O, O, O, O, O.	
	O, O.
O, O, O, O, O, O, O, O, O.	

The number thus expressed is 1928, and per said Code is
"WHAT IS YOUR CARGO?"

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O.	
	O, O, O, O, O, O.
	O.
O, O, O.	

Here the number expressed is 5603, and stands for
"HAVE YOU ANY NEWS?"

(RED LIGHT.) (GREEN LIGHT)

Fig. 2

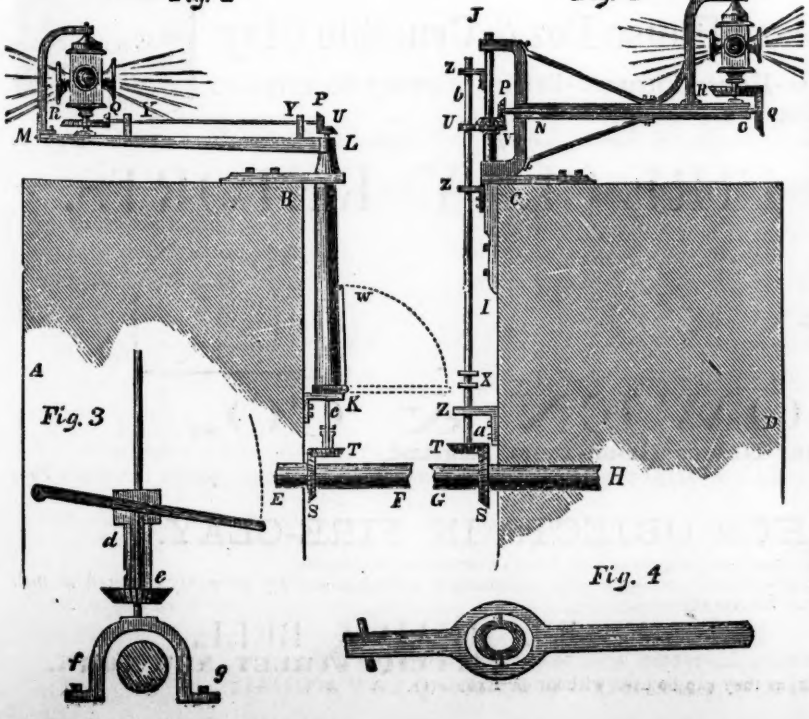


Fig. 3

Fig. 1

Fig. 4

MECHANICAL CONSTRUCTION.

In our engravings, Figs. 1 and 2, represent Vertical Sections through the wheel-house. In them E F and G H represent portions of the main Shaft. In Fig. 1, I J is a stout Iron or Wooden post, fastened against the side of the wheel-house, directly over the main shaft On the upper part of this post, is fitted the moveable arm or crane N O, to the main shaft is fitted the bevel wheel S, and to the lower end of the rod a b, is fitted a corresponding wheel T. U is a small pinion on a b, which gears with the spur wheel, V, which in turns gives motion to the wheels, P and Q, and so revolves the lamp R. It will be seen that a Rotary motion is given to the lamp, when the main shaft is in motion and a b connected.

It can be disconnected by a lever, acting between the bosses X, which will elevate the rod in the guides Z Z Z.

Fig. 2 is another arrangement, for the same purpose. In this, K L, represent a hollow Shaft, on which is firmly fastened, the arm L M, on which is the lantern. The hollow post is secured to the wheel-house by the straps K and B, and it can turn freely in them, the other part being the same in them as in fig. 1

The lever K W, when drawn down, will turn the frame in any required position around the Shaft c U. In fig. 1, the arm or crane N O, may be operated by cords from the wheel house, but in this device, the rod c U. does not lift up as in fig. 1, but in its place, the lower end is made square, and on it slides the short tube, d E shown in fig. 3 The lower end of the rod turns on a bridge, f g, spanning the main shaft On the upper end of the tube, d e, a lever is attached by means of boxes and collars as shown in fig. 4. This lever when raised carries with it the beveled wheel T, thus disconnecting the gearing apparatus.

ALBERT POTTS, Patentee,
PHILADELPHIA, Pa.

THE

STERLING GAS-REGULATOR,

Improves the Light and Saves a Large Per Centage of Gas.

MANUFACTURED BY THE

WHEELER & WILSON SEWING MACHINE COMPANY.

It is well known that Printers require the best and most brilliant light In proof of the superiority of these Machines over all others, the following New York establishments are using them, and testify to their excellence:—New York Times, New York Herald, New York World, New York Tribune, New York Sun, Journal of Commerce, Courier & Enquirer, Evening Post, The Zietung, Dispatch, Leader, Scientific American, Advertiser and Spectator, Independent, Daily News, Harper's Monthly and Weekly, Transcript, Mercury, Atlas, Life Illustrated, Albion, Spirit of the Times, AMERICAN GAS-LIGHT JOURNAL, Christian Enquirer, Churchman, Church Journal, Christian Advocate, Christian Ambassador, Christian Intelligencer, Observer, Sunday Times, Sunday Courier.

By order of the New York and Brooklyn Common Councils, these Regulators are now used in the City Halls, Police Stations, Markets, and other Public Buildings in both cities.

They are Warranted by the

WHEELER & WILSON SEWING-MACHINE CO.,

505 BROADWAY, NEW YORK.

To keep in order, and always maintain the pressurs of the Gas at the lowest point for a brilliant light and economical combustion. They are so constructed that *under no circumstances can the Mercury get into the Meters, or in any way injure them.*

WARREN'S PATENT WATER & ALARM GAUGE,

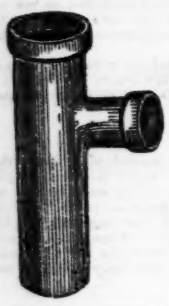
For Protecting the Flues and Preventing Steam-Boiler Explosions.

This is a reliable High and Low Water Detector, arranged so as to render it one of the best Water Gauges ever attached to a Steam-Boiler; always presenting before the Engineer at sight the exact height of the water, and if, by oversight or by sudden leakage, the water gets low in the boiler, it will cause an alarm before the water gets below the flues, thereby preventing an explosion. This Gauge can be made to alarm at any point desired as a High Water Detector, thereby preventing the water from getting to that height as to be forced into the cylinder of the engine, often causing serious accidents. Thus it is a High as well as a Low water Detector. For sale by

WARREN & BANKS,

153 Centre st., corner of Canal st., New York,

Where a Gauge is constantly in operation.



GAS, STEAM, SMOKE,

PURE WATER & SOIL PIPE,

FROM

JOSEPH CLIFF

Wortley Fire-Brick Works, Leeds, England.

T. W. PARMELE, Agt.,

No. 4 Irving Place, N. Y.

JOHN RUSSELL & CO.,

PATENT TUBE MAKERS,

THE OLD TUBE WORKS, WEDNESBURY, AND THE ALMA WORKS, WALSAL, STAFFORDSHIRE,

69 UPPER THAMES ST., & 5 CHARLES ST., SOHO, LONDON;

AND 35 GRANBY ROW, MANCHESTER, ENGLAND.

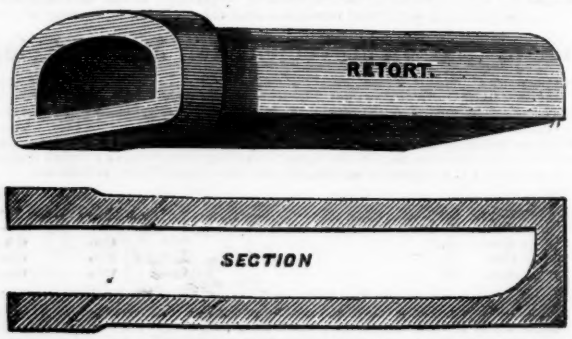
The original Manufacturers of WROUGHT-IRON GAS TUBES, and the Inventors of the Lap-welded Tubes for Locomotive and Marine Boilers. All kinds of TUBES and FITTINGS, whether for Gas, Steam, or Water. Galvanized and Composition Tubes. Chandeliers, and every kind of Brass work for Gas and Steam.

STOCKS, DIES, AND TAPS OF ALL SIZES. CAST-IRON PIPE AND GAS-METERS.

All Goods Warranted.

KING BROTHERS,

STOURBRIDGE, ENGLAND, FIRE-BRICK AND RETORT WORKS.



KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them

Free from Cracks and Correct in Form.

By great care in Manufacturing, combined with the advantages in Burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

EVERY RETORT AND BRICK IS BRANDED "KING BROTHERS, STOURBRIDGE."

Apply to E. W. BARSTOW, 83 Maiden Lane, New York, where samples can be seen.

HARRIS & PEARSON,

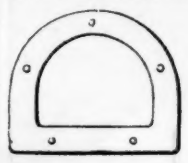
PROPRIETORS OF

Best Glass-House Pot & Crucible Clay.

Manufacturers of Fire-Bricks, Gas-Retorts, and Glass-House Furnace-Bricks of every description.

AMBLECOTE FIRE-CLAY AND BRICK WORKS, STOURBRIDGE, ENGLAND.

OWEN'S PATENT FIRE-CLAY RETORTS.



JOSEPH COWEN & CO.,

BLAYDON BURN, near Newcastle-on-Tyne, England,

Have always been, and are still, the most extensive manufacturers of FIRE-CLAY RETORTS in the United Kingdom, and were the only parties to whom a Prize Medal was awarded at the Great Exhibition, in London, 1851, for

"GAS RETORTS, AND OTHER OBJECTS IN FIRE-CLAY."

J. C. & CO. make Fire-Clay Retorts of all shapes and dimensions, and to fit existing mouth-pieces.

Orders for FIRE-CLAY RETORTS, TILES, BEARERS, and other articles in Fire-Clay, receive immediate attention, and are promptly executed at their Works, as above. Drawings of Settings adapted for Cowen's Patent Fire-Clay Retorts supplied.

AGENTS, MESSRS. MEAD & BELL,

13 CLIFF STREET, NEW YORK.

N. B.—J. C. & CO.'S RETORTS are well adapted for small Gas-Works, as they can be used without an Exhauster.